Following New Trails

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PROGRESS IN READING

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PREFACE FOR BOYS AND GIRLS

Have you ever stopped to think how many times a day you read? When you get up in the morning, you may read the paper or look in the radio guide to see what programs are on the air. On the way to school, if you live in town, you may read the signs in the store windows. And after you get to school, you use books almost every hour of the day.

There are stories in this book that you will read just for fun. You will surely laugh when you read the story called "The Beaver People." There are lessons that tell you important facts that you want to know. One lesson tells you how to take care of burns. But whether you read just for fun or to find out something that you need to know, you must be able to read well.

There are four things that you need to know in order to make good use of books:

First, how to find something that you want to read. Sometimes you will want to find information about some question that interests you. At other times you will want to find a good book or a story to read just for fun.

Second, how to understand what you read. You will need to know just what the author means, to decide which things that he tells are important, and to select just the information that you need in order to answer a question.

Third, how to organize the facts that you read. Sometimes you will find important facts about a question in more than one book. You must be able to put these facts together so as to answer your question.

Fourth, how to remember what you read. You must learn to decide what is worth remembering, as well as what to do to remember it.

Following New Trails will help you to learn to do all of these things. Your part will be to practice these skills, not only when you read this book but also when you read other books, both in school and out of school.

THE AUTHORS

Following
New Trails

The Home on Wheels[1]

This story is about a trip to the West, but it does not tell about one that was really taken. In one way, however, it is a true story. It tells about things that often happened on these trips. Before writing this story, the author found out a great deal about the adventures and difficulties that travelers met in going West. Then she wrote the story. From it you can learn a great deal about how the early pioneers made the trip to the West.

I. STARTING OUT

Richard and Ellen could not sleep that first night in the covered wagon. Mother and Baby Hugh were fast asleep; one could hear their deep, even breath-

[1] From *America Travels*, by Alice Dalgliesh. By permission of The Macmillan Company, publishers.

ing. To the two older children it was all so thrilling that they could not settle down. Through the canvas flaps of the wagon they could see the dark sky, set with stars. Some of the men were still talking by the campfire. Richard sighed and pulled the blanket closer. It was warm and comfortable in the wagon, but he would have liked to be outside. For a long time the children lay there drowsily, then somehow they fell asleep.

In the morning all kinds of noises awakened them, the sound of people rushing about getting ready to start, loud talk of the trail and of the gold that lay at the end of it, high spirits for the first exciting days of the journey. There was not much room to dress in the wagon, for there was so much of everything in it. Barrels of flour with eggs neatly packed in the middle, other food supplies, tools, clothing, bedding, even the clock that Mother would not leave behind. The first breakfast in the open air! The morning was crisp and cool, and the bacon sizzled cheerfully. Why did people talk of the hardships of the overland trail?

That night the travelers sat around the campfire. Luke played on his fiddle. Philip played on his flute. The sad little tune floated off into the darkness.

> Home, home, sweet, sweet home,
> Be it ever so humble there's no place like home!

There was a choking sound from one of the women. She was thinking of the comfortable home she had left in Iowa. Nothing but a home on wheels for months to come!

"Play something cheery, Luke!" whispered one of the men. Luke drew the bow across the strings of his fiddle and swung into a gay tune.

> Oh, Susannah,
> Don't you cry for me,
> For I'm going to California
> With my wash bowl on my knee.

Voices joined in. The fire crackled and the darkness was full of song. Richard and Ellen were sorry when it was time for bed.

Those first days were not unpleasant, in spite of bad roads. In the daytime there was a long trail of white-topped wagons with men and cows walking beside them. At night the wagons formed a corral, or closed circle, for protection in case of an Indian attack. Much to the relief of the older people, but rather to the disappointment of the children, they saw few Indians.

One morning as they were breaking camp a small group of Indians did ride up, but they seemed to be merely curious and ready to be friendly. Richard was standing by the wagon with Hugh in his arms. The morning sun shone on the baby's red-gold curls, and one of the Indians gave a grunt. He got down from his horse, pointed to the baby, to himself, and then to the horse. He would trade the horse for the baby! Richard held Hugh tightly, shook his head, and stepped back into the shelter of the wagon. When the Indians rode away, Richard gave a sigh of relief.

There was often the excitement and danger of cross-

ing rivers. The first river was deep and muddy, and there were only two flatboats to ferry hundreds of wagons across. That meant a long wait. Some streams were shallow and could be forded by the wagons. The oxen were driven in, and soon the water came far up on the wheels. It gave one a queer feeling to sit in the wagon and watch the water swirling almost at one's feet. If only the stream did not get too deep!

The worst crossing was a deep river where there were no ferries. There the men had to take the wagon bodies off the wheels and fill the cracks with tar so that the flat bodies could be used as boats. All the

goods and supplies had to be unpacked, taken across the river, and packed again.

On and on went the wagons, over roads so thick with dust that one could not see ahead. At night Richard and Ellen slept warmly in the wagon, Ellen wrapped in a blue-and-white coverlet that her grandmother had woven. Down in the corner of it were her grandmother's name and the date. The coverlet was Ellen's favorite possession, and it was going all the way to California. It would make her feel more at home to see its familiar blue-and-white pattern on the bed in a new house.

What Can You Learn from Stories?

The following questions will show how much you have learned from the part of the story you have just read.

1. What was the home on wheels?
2. How did most of the people feel when they first started out?
3. Where did the people sleep?
4. What things did the people take West with them?
5. Where did they eat?
6. What was one way in which they entertained themselves?
7. What animals besides oxen did the pioneers take with them?
8. How did these pioneers protect themselves at night against Indian attacks?
9. In what three ways did they cross rivers?
10. What did Ellen take along to make her feel more at home in California?

II. CROSSING DESERTS AND MOUNTAINS

On and on! Over roads even worse than before crawled the wagons, over mountains, through valleys, and over plains. On and on and on! They came to the grassy meadows before a long desert. Everyone had to turn to and make hay to feed the oxen during the days when there would be no grass. Then the hardest part

of the journey was begun. The sun was burning hot. The ground was dry and hard. Everyone who could walk beside the wagons did so to make the wagons lighter for the oxen. Ellen rode with Baby Hugh; Father and Mother and Richard walked. On and on! Now the sand was heavy and deep, so that the wheels of the wagons sank into it. Deserted wagons and dead oxen told the tale of difficulties met by other travelers.

"We'll never make it," said the men. "The loads must be made still lighter."

All the heavy things went first, cookstoves and barrels of supplies. Still the wagon wheels moved heavily and the oxen strained at their yokes. The poor animals were growing tired. If they died, there would be no hope of getting out of the desert.

The day came when everything that could be taken out to make the wagons lighter was taken out. Richard and Ellen helped to carry the things to the side of the trail and pile them up; all their dearest possessions, with Mother's clock ticking steadily on top of the pile.

"Oh, Father," said Ellen, "must I leave Grandmother's coverlet? *Please* let me keep it."

"We'll have to leave it," said Father. "It's leave everything now, or die ourselves."

The blue coverlet joined the pile at the side of the trail; so did Richard's gray blanket. The men made a sign such as they had seen in other places, "Help yourself." Perhaps a lighter wagon would be able to use some of the things they had left.

"I hope someone will take my pretty blue coverlet," said Ellen sadly.

"Most likely before the week is out an Indian baby will be wrapped in it," said Richard.

"Don't tease your sister, Richard," said Mother. "We have troubles enough without that."

They were near the edge of the desert now, and it was well, for the water barrels were almost empty. A different danger lay ahead, for in the distance were the snow-capped peaks of a great range of mountains. Ellen felt weak and tired. As she lay in her bed at night, an endless procession of dreary scenes kept go-

ing through her mind: burning hot days on the prairies; choking dust; sand, miles and miles of it; the kitchen clock and the blue coverlet by the side of the trail; Bright, their favorite ox, lying dead; heat and thirst; Baby Hugh crying pitifully for water; hunger. Now she was sure that she knew all the hardships of the California trail.

Mountain travel was dangerous, but a welcome change. These mountains were worse than those that they had passed. There were times when wagons had to be unpacked and lowered over cliffs, or dragged up a steep, rocky wall. At other times they toiled up long hills almost too steep for the oxen, or went through deep, gloomy ravines. It was solemn and lonely in the mountains, and nights were cold. Everyone longed for the warm coverings left behind in the desert.

At last the road began to go downward. The grass was fresh and green and full of flowers. California was near! The travelers were at the end of the trail, and there was a pleasant grassy valley and a good place to camp. That night there was music and cheery talk around the campfire. Richard and Ellen listened to a surprising conversation between two of the older men. One of them said solemnly, "Providence has blessed and favored us through this long journey." "Indeed, yes," said the other. "We have not met with accident or disease and have traveled smoothly and quietly." Richard and Ellen gave each other a wondering look. So the journey had been an easy one!

The story might end here with the making of new homes. For Ellen it ended later, when in another cabin she saw a blue-and-white coverlet on a bed. Ellen lifted a corner of it and looked. There was the woven name:

ELLEN ADAIR

Her grandmother's name! Ellen dropped the corner of the coverlet without saying a word. The sign had said, "Help yourself"; she had no right to the coverlet now. That was just a part of life on the trail.

Alice Dalgliesh

Can You Draw Conclusions from What You Read?

Good readers are able not only to understand the facts that they read, but also to use the facts in their thinking. To draw conclusions means to use facts to get new ideas. The following questions will show how well you can find the facts in a lesson and then how well you can use the facts to draw conclusions from the lesson.

1. What were the oxen fed while the pioneers were crossing the desert?
2. Why did the loads have to be made lighter for the trip across the desert?
3. When the pioneers needed to lighten the heavy wagons, why did they not leave the hay behind rather than the cookstoves?
4. During what season of the year was this trip taken?
5. Why did the pioneers have to carry water with them?
6. How do you know that the mountains they crossed after leaving the desert were very, very high?
7. In what ways were the difficulties and dangers of crossing the mountains different from those of crossing the desert?
8. Why was Ellen surprised that the men thought they had been lucky on their journey?
9. Why did Ellen not ask for her coverlet when she found it?

Building a Vocabulary

When you were first learning to read, you probably knew the meanings of most of the words in your books. Of course you had to learn to read the words, but you had no trouble in understanding what such words as *mother*, or *boy*, or *run* meant.

Now you sometimes come upon words the meanings of which are not clear to you. Perhaps you haven't any idea what the words mean. It is important, however, for you to learn the meanings of new words, for understanding them will help you to enjoy reading. Besides, you cannot expect to have a clear understanding of what you read unless you know what the words mean. Learning the meanings of words is called building a vocabulary. Remembering the meanings is also a part of vocabulary building. The words that a person is able to use are called his vocabulary.

Many words used in "The Home on Wheels" are often used in the stories about pioneers. Fifteen such words are listed on page 23. Did you know each of these words? What did you do if you didn't know the meaning? Do you know the meaning of each one now?

One good way to decide what new words mean is to notice how they are used in sentences. In order to see how this plan helps, follow these directions. First, for each word in the list, find in the story a sentence in which it is used. Then, after you have read the sentence, choose, from the list of fifteen definitions

given below, the one that best fits the meaning of the word in that sentence.

hardships	coverlet	procession
corral	ravines	toiled
to ferry	deserted	Providence
forded	yokes	possession
trail	flatboats	overland

1. A cover for a bed
2. To carry persons or things over a body of water in a boat
3. Frames of wood used to join animals together for pulling
4. Left behind
5. Things that are hard to bear
6. Crossed a body of water by wading
7. A closed circle made by the wagons
8. The loving care of God
9. Something moving forward in an orderly way
10. Long, deep hollows, or gullies, made by running water
11. Something belonging to oneself
12. Worked very hard
13. By way of land rather than by water
14. Boats with flat bottoms and square ends
15. A track worn by passage through wild unsettled regions

When you have chosen the definition that best fits the meaning of each of the words, use each word in a sentence of your own.

Rating Yourself for Courtesy

The boys and girls in one fifth grade made what they called a self-rating card in courtesy. They wrote twenty-eight questions on this card. These questions were planned so that the answers would show how courteous the children were and would give them a rating for courtesy. Because the children could use the questions themselves to find this rating, they called the card a self-rating card. The questions were about things that the children thought were courteous to do at home, at school, and in public. There are many courteous acts that were not put on the card, because the boys and girls decided to have only twenty-eight questions.

The purpose of this lesson is to help you think of ways in which to be courteous. It gives a list of the questions that were on the self-rating card. You may wish to discuss the questions in class before you rate yourself. The following directions will help you to do this.

1. Describe situations which the questions remind you of.
2. Think of some person who does especially well the courteous acts about which the questions ask.
3. Tell how that person would act in the situations suggested by these questions.

You can find out how you rate by reading the questions and answering them honestly. You need not show your answers to anyone. Number your paper from 1 to 28. Read the first question. Is your answer *Yes* or *No*? Write your answer opposite number 1 on your paper. Do the same for the rest of the questions. *Do not write in this book.*

1. Do I show that I am sorry when I run into someone?
2. Am I always polite when I ask a favor of someone?
3. Am I careful not to laugh at other people's mistakes?
4. Do I promptly offer a chair to people who call at my house?
5. Do I excuse myself when I walk in front of someone?
6. Do I take good care of the things I borrow?
7. Do I talk in a quiet tone on the street?
8. Am I careful not to interrupt people except when it is necessary?
9. Am I willing to share my things with other people?
10. Do I meet people at the time I promise to meet them?
11. Do I always remember to thank people when they have done something for me?
12. Am I a good sport even when I am losing in a game or in a contest?
13. Do I do cheerfully and without complaining what I am asked to do?

14. Do I try not to be quarrelsome with my playmates and neighbors?

15. Am I always polite to people who wait on me in stores?

16. Do I help little children when they are in trouble?

17. Am I good-natured when people tease me?

18. Do I leave other people's things alone unless I am given permission to handle them?

19. Have I learned not to argue unpleasantly?

20. Do I keep from whining and pouting when I cannot have my own way?

21. Do I do things promptly when I am asked?

22. Do I listen courteously when people are talking to me?

23. Am I careful not to blame other people for my mistakes?

24. Am I careful not to talk during public entertainments?

25. Do I show my own family all the courtesies that I show to people outside of my family?

26. Do I always speak pleasantly when I answer the telephone?

27. Do I wait my turn when I am standing in line at the theater, at the post office, or at school?

28. Do I always remember to write thank-you letters to people who send me gifts?

Count the number of questions to which you have answered *Yes*. That number is your rating. How close to twenty-eight does it come?

The Table of Contents

Almost every book contains a list of the lessons or chapters in it and the number of the page on which each lesson or chapter begins. This list is called the Table of Contents or sometimes just the Contents. It is found in the first part of a book. It tells what the book is about. A great many people like to look through the table of contents whenever they get a new book. It helps them to find out what kind of book it is. Turn to the Contents of this book. Look through it quickly to see what the lessons are about.

I. CAN YOU USE THE TABLE OF CONTENTS IF YOU ARE GIVEN THE TITLE OF A LESSON?

A table of contents may save time if it is used well. It is much easier to find a title or a subject in the contents than it is to turn through the pages of the book. Below are the titles of ten lessons in this book. See how quickly you can find each of them in the Contents. Number your paper from 1 to 10, and after the numbers write the page on which each lesson begins. *Do not write in this book.*

1. The Cattle Kingdom
2. The Stylish Rat
3. The Journey
4. The Home on Wheels
5. The Tiniest of All Birds
6. A Tree-Ring Calendar

7. The Sugar Camp
8. The Pony Express
9. Grandfather's Reading Lesson
10. The Beaver People

II. CAN YOU USE A TABLE OF CONTENTS IF YOU ARE NOT GIVEN THE EXACT TITLE?

Many of the lessons in this book that deal with special skills in reading are listed in the Contents. When you discover that you need practice in one of these skills, you will wish to locate the right lesson.

The nine reading skills in the list below are not given in the exact words of the titles of the lessons. Turn to the Contents and try to find a lesson that tells about the first skill. Write the number of the page on which it begins. Then turn to the page to see whether or not the lesson is about the skill. If you did not choose correctly, try again. Do this for each skill.

Number your paper from 1 to 9 before you begin to work. *Do not write in this book.*

1. How to read arithmetic problems
2. How to read a bar graph
3. How to read a title page
4. How to read an outline
5. How to remember
6. How to read a road map
7. How to use a dictionary
8. How to read a table
9. How to use an encyclopedia

Making a Record

This is a true story about a boy. The story starts when he was in the first grade and stops when he was in the eighth grade. We will call him Donald Stern, although that was really not his name. The story is told through the records of Donald's visits to the Children's Hospital in Iowa City, Iowa. As you read this lesson, notice what valuable information Donald learned each time he visited the dentist at the hospital.

FIRST VISIT, October 20, 1931

The doctor who examined Donald found that he was twenty-two pounds underweight. He was pale and thin. His teeth were very bad. Mrs. Stern told the doctor that most of the time he was too tired to study or play. The doctor told Mrs. Stern to have Donald's

teeth examined. Bad teeth are usually a sign of poor health and may be the cause of it.

When the dentist examined Donald's teeth, he reported that Donald still had his first teeth, but that they were badly decayed. There were fourteen holes in them. One tooth would have to be pulled at once. All the teeth were soft and dark in color. Teeth should be hard and ivory-colored.

Donald's mother said that Donald brushed his teeth carefully twice a day. She said that she had always believed that clean teeth do not decay. The dentist told her that we now know that clean teeth often do decay. He said that it is important, however, to brush the teeth carefully.

This is what the dentist told Donald: "Brush your teeth twice a day. This will keep them clean and exercise the gums. Get plenty of fresh air, sunshine, and sleep. Play as much as you can out of doors. Most important of all, eat the foods that make strong, healthy teeth. I will tell you about these foods when you come back again.

"Come back next Friday to have some of your teeth filled and one of them pulled."

SECOND VISIT, October 23, 1931

The dentist pulled one tooth that was not worth filling. Then he filled six holes in Donald's teeth. These were the largest holes. Seven small holes were not

filled because the dentist wished to show Donald and his mother that teeth, even with small holes in them, can again become healthy if the right foods are eaten. He gave Donald a card that told him what foods to eat. This is what was on the card.

EAT THESE FOODS EVERY DAY	
One quart of milk	One orange or tomato
At least one egg	One other fruit
A little meat or fish	One teaspoon cod-liver oil
Two vegetables (one raw)	Six teaspoons butter

This is what the dentist told Donald about his food: "Eat all the foods on the card every day. Eat bread and potatoes, too, but do not eat so much bread and potatoes that you are not able to eat all the foods on the list.

"Eat very little sugar, and never eat candy except immediately after a meal. If you get hungry between meals, eat an apple or a raw carrot.

"At meals be sure to chew your food well. Be sure to eat some hard foods, like crusts of bread. This exercises the teeth and jaws."

Donald said that he did not like some of the foods on the list, but that he would eat them every day and try to learn to like them. The dentist told Donald that he should come back to see him again in five or six months.

THIRD VISIT, March 18, 1932

Donald's physical examination showed that he had gained weight since his last trip to the hospital. He was still a little thin, but he was no longer pale.

When he went to the dentist to have his teeth examined, Donald said that he had been eating the foods on the list every day since he was at the hospital last October. Donald said that he was beginning to like them too. The dentist found no new holes in Donald's teeth. The decay in the seven holes that had not been filled had stopped, and the teeth were harder and a better color. The dentist told Donald's mother that the decay had stopped because a hard lining had formed in them. He said that healthy teeth build hard linings in the holes to keep decay from eating away any more of the tooth.

FOURTH VISIT, February 20, 1933

Donald was no longer underweight. His weight was now normal. He was no longer thin and pale. He could play for hours without getting tired. He had several new teeth, and all of them were healthy.

FIFTH VISIT, September 21, 1936

Donald's weight was still normal. He had lost most of his baby teeth. All his second teeth were hard and

ivory-colored. He said that he ate all the foods on the list every day and now liked all of them.

SIXTH VISIT, January 19, 1938

Donald's weight was still normal. The dentist cleaned his teeth and said they were fine. There were no new holes in them. Donald had nearly all his new teeth now. He was to come back to the dentist as soon as he had all his second teeth.

SEVENTH VISIT, October 20, 1938

Donald's weight was still normal.

He had all his second teeth. They were hard, ivory-colored, and healthy. There were no holes in any of them.

He was a strong, healthy boy, not at all like the pale, thin boy that he had been seven years before. He looked happy and seemed proud of his fine teeth. His mother said that she never worried about his health or his teeth any more. He ate the right foods, and he liked to eat them. He never ate candy between meals.

Donald said that he went to a dentist in his own home city every six months. He had his teeth cleaned and looked over, so that he could be sure that they were healthy.

Not a new hole in a tooth in seven years. What a record!

Can You Locate the Part of a Lesson That Answers a Question?

Notice that the lesson tells about Donald's seven visits to the dentist. Number your paper from 1 to 15. After the numbers write the number of the visit that gives the answer to each of the following questions. Do not write the answers to the questions.

1. What fine record did Donald have at the end of seven years?
2. What color are healthy teeth?
3. What is the most important thing to do in order to have healthy teeth?
4. How often should teeth be brushed?
5. When was Donald's weight normal for the first time?

6. How much cod-liver oil should one take each day?

7. How often did Donald go to a dentist in his home city to have his teeth cleaned and looked over?

8. Why did the dentist tell Donald to eat hard foods like crusts of bread?

9. Why did the dentist not fill all of Donald's teeth?

10. How is decay in teeth stopped?

11. Was Donald eating the right foods in 1936?

12. What kind of teeth did Mrs. Stern think would never decay?

13. How does brushing help the teeth?

14. How much milk did Donald drink each day?

15. Did Donald have all his second teeth in January, 1938?

Can You Match Questions and Answers?

Now that you have located the answers to the questions, you should have no trouble in deciding which of the following words and phrases answers each question. You have already numbered your paper from 1 to 15 and written the numbers that tell which of the visits gives each answer. Now, after the number of the visit, write the letter of the answer that matches each question. *Do not write in this book.*

a. Ivory
b. One teaspoon
c. Twice a year
d. Eat the right kind of food

e. To show that decay can be stopped

f. 1933

g. Cleans the teeth and exercises the gums

h. Not a hole in a tooth in seven years

i. Clean teeth

j. Twice a day

k. By the hard linings that healthy teeth build in holes

l. One quart

m. No

n. To exercise the teeth and jaws

o. Yes

Can You Make Rules for Healthy Teeth?

Donald Stern made a fine dental record because he learned how to have healthy teeth. Glance quickly through the report of each visit that he made to the dentist and select the rules that Donald learned to follow. Write these rules in a list on your paper. You should have at least seven rules.

When you have finished your list of rules for healthy teeth, go over it and decide how many of the rules you follow.

Learning to Use a Dictionary

No book is more helpful for learning words than the dictionary. It tells how words are spelled, how they are pronounced, and what they mean. Some dictionaries, especially the very large ones, tell many other useful facts about words.

Unless you know the alphabet "by heart," you will have trouble finding words in the dictionary. This is because the words in the dictionary are listed in alphabetical order. That means that they are listed in the same order as the *A B C*'s.

I. HOW WELL DO YOU KNOW THE ALPHABET?

In the list below there is one word beginning with each letter of the alphabet. How many words are there? How many letters are there in the alphabet?

ill	only	eat	both
quite	X ray	note	plain
young	candy	was	make
all	line	have	glad
key	joy	real	date
under	time	zipper	vacation
	such	fast	

1. Number your paper from 1 to 26. After the numbers write the *A B C*'s in order.

2. After each number and letter write the word from the list that begins with that letter.

You will be able to find words in the dictionary much more quickly if you know in what part of the alphabet the first letter of the word comes. From the list you have just made you can see that *m* and *n* are in the middle of the alphabet, and so words beginning with these letters will be found near the middle of the dictionary. Words beginning with *a*, *b*, *c*, or *d* will be found in the first part of the dictionary. Words beginning with *t*, *u*, *v*, *w*, *x*, *y*, or *z* will be found in the last part of the dictionary.

What letter in the alphabet comes just before and what one comes just after each of the letters given below? Number your paper from 1 to 12. After each number write the missing letters. Be ready to tell in what part of the dictionary you would look for each of these groups of letters. *Do not write in this book.*

1. _ s _	5. _ w _	9. _ c _
2. _ o _	6. _ l _	10. _ p _
3. _ g _	7. _ m _	11. _ y _
4. _ e _	8. _ i _	12. _ j _

II. HOW ARE WORDS ARRANGED IN ALPHABETICAL ORDER?

You have already learned that words in the dictionary are listed in alphabetical order. It is not hard to find words in an alphabetical list when there is only one word beginning with each letter. In the diction-

ary, however, there are many pages of words beginning with the same letter. To look at every word beginning with any one letter would be a long, tiresome job. What should you do?

1. When the First Letter Is the Same

If you need to find the words *saw* and *see* in the dictionary, you do not have to hunt through all the pages of words beginning with *s*. Look at the second letters of these words. In the dictionary, *saw* is put before *see* because *a* comes before *e* in the alphabet. *Bird* comes before *bud* in the dictionary because *i* comes before *u* in the alphabet.

Number your paper from 1 to 9. After each number write the word that would come first in each of the following groups of words if you were to arrange them alphabetically.

1. led
   law
   lot

2. on
   off
   out

3. pen
   put
   paw

4. some
   sun
   send

5. tan
   ten
   ton

6. velvet
   vacation
   vote

7. cone
   cry
   can

8. low
   lunch
   lye

9. milk
   money
   mad

2. When the First Two Letters Are the Same

In the words *came* and *can* the first two letters are the same. When the first two letters of words are alike, you must look at the third letter of each word in order to arrange them alphabetically. The word *came* comes before *can* in the dictionary because the letter *m* comes before *n* in the alphabet. *Each* comes before *east* in the dictionary because *c* comes before *s* in the alphabet.

Number your paper from 1 to 12. After each number write the word that would come first in each of the following groups of words if you were to arrange them alphabetically. Remember to look at the third letter of each word.

1. file
   fine
   firm

2. ant
   anyone
   answer

3. come
   cool
   coat

4. heal
   help
   hem

5. spoil
   spring
   spark

6. talk
   tame
   table

7. yonder
   you
   yoke

8. wool
   wonder
   work

9. pantry
   park
   palace

10. seed
    sell
    seam

11. easy
    earn
    each

12. damp
    dark
    dance

3. When More Than the First Two Letters Are the Same

In such words as *desert* and *deserve*, where several letters at the beginning of the words are alike, you must find the first letter in each word that is different. *Desert* comes before *deserve* in the dictionary because the letter *t* comes before *v* in the alphabet. How many letters in these two words are the same?

Arrange the following list of twelve words in alphabetical order.

1. heading
2. telegram
3. sweep
4. sweet
5. headline
6. telephone
7. office
8. selfish
9. offer
10. swell
11. headlight
12. officer

Number your paper from 1 to 9. Each number will stand for one of the groups of words below. After each number write the word in that group that comes first in the dictionary.

1. banks
   banking
   banker

2. courage
   couple
   course

3. soldier
   solid
   solve

4. freedom
   freeze
   freely

5. wonderful
   wonder
   wondrous

6. dread
   dreary
   dream

7. twenty
   twelve
   twelfth

8. stopper
   stone
   stood

9. promise
   program
   problem

The Sugar Camp

Many, many years ago Charles Dudley Warner grew up in Massachusetts. In his book *Being a Boy* he tells of many things that he did as a boy on a New England farm. This story tells of life in an old-time maple-sugar camp. Even today, in many parts of New England, maple sugar is made in very much this same way.

I think there is no part of farming a boy enjoys more than the making of maple sugar. It is better than blackberrying, and nearly as good as fishing. One reason that he likes this work is that somebody else does most of it. It is the sort of work in which he can pretend to be very busy and yet not do much.

As I remember the New England boy (and I was one once), he used to be eager in the spring for the sap to begin running. I think he discovered it as soon as anybody. Perhaps the boy has been out digging into the maple trees with his jackknife. At any rate, he is pretty sure to shout the discovery as he comes running into the house. In great excitement, he yells, "Sap's runnin'!"

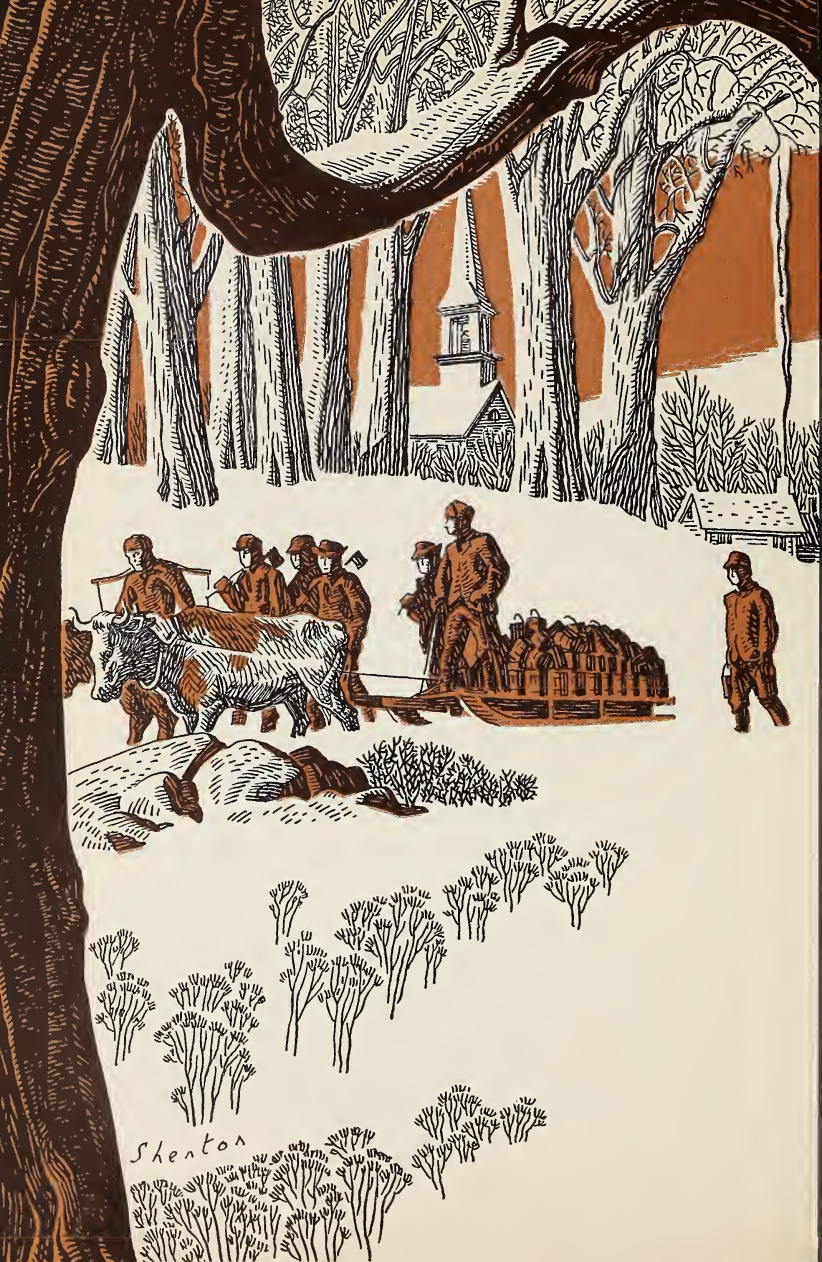
Then the hurry and excitement really begin. The sap buckets, which have been stored in the attic over the woodhouse, are set out on the south side of the house and scalded. The snow is still a foot or two deep in the woods, and the ox sled is got out to make

a road to the sugar camp. The boy is into everything, asking questions and getting more excited all the time.

It is a great day when the cart is loaded with the buckets and everyone starts into the woods. The sun shines almost everywhere in the forest, for there are no leaves to hide it now. The snow is soft and beginning to sink down, leaving the young bushes showing up everywhere. The snowbirds are twittering about, and the noise of shouting and the blows of the ax echo far and wide. This is spring, and the boy is delighted that his outdoor life is about to begin again.

In the first place, the men go about and tap the trees, drive in the spouts, and hang the buckets under them. The boy watches all this work with the greatest interest. He wishes that sometime, when a hole is bored in a tree, the sap would spout out in a stream as it does when a cider barrel is opened; but it never does. It only drops, sometimes almost in a stream, but usually slowly. The boy learns that the sweet things of the world have to be patiently waited for, and do not usually come otherwise than drop by drop.

Then the camp is to be cleared of snow. The shanty is covered with branches again. Two huge logs are rolled nearly together in front of it, and a fire is built between them. Forked sticks are stuck into the ground at each end, and a long pole is laid across them. On this the great kettles are hung. The huge


Shenton

barrels, called hogsheads, are turned right side up, and cleaned out to receive the sap. And now, if there is a good "sap run," the sugar camp is really going.

The great fire is never allowed to go out, night or day, as long as the season lasts. Somebody is always cutting wood to feed it. Somebody is busy most of the time gathering in the sap. Somebody must watch the kettles to see that they do not boil over, and to fill them. It is not the boy, however, for he is too busy to be of use in such little things. He has his own small pails, with which he gathers the sweet liquid. He has a little boiling place of his own, with small logs and a tiny kettle.

In the great kettles, the boiling goes on slowly. The liquid sap, as it thickens, is dipped from one kettle to another, until in the end kettle it has become sirup.

Then the sirup is taken out to cool and settle until enough is made to "sugar off." To sugar off is

to boil the sirup until it is thick enough to crystallize, or turn into sugar. This is a grand event, and it is only done once in two or three days.

But the boy wants to sugar off all the time. He boils his kettle down as rapidly as possible. He is not particular about getting chips, scum, or ashes into it. He is likely to burn his sugar. But, if he can get enough to make a little wax on the snow, or to scrape from the bottom of the kettle with his wooden paddle, he is happy. A good deal is wasted on his hands and the outside of his face and on his clothes, but he does not care. He is not stingy.

To watch what is going on at the big fire always pleases him. Sometimes he is left to watch the boiling kettles. He is always tasting the liquid, however, to see if it is not almost sirup. He has a long round stick, whittled smooth at one end, which he uses for this. He is always in danger of burning his tongue. The smoke blows in his face. He is grimy with ashes. He is such a bundle of dirt, stickiness, and sweetness that his own mother wouldn't know him.

He likes to help a hired man boil eggs in the hot sap. He likes to roast potatoes in the ashes. He would live in the camp day and night if he were permitted. Some of the hired men sleep in the shanty and keep the fire blazing all night. To sleep there with them, and wake in the night to hear the wind in the trees and see the sparks fly up to the sky, is a real adventure. He tells the other boys afterwards that he

heard something in the night that sounded very much like a bear. The hired man says the boy was very much scared by the hooting of an owl.

The most exciting times for the boy, though, are those of sugaring off. Sometimes this is done in the evening, and there is a party in the camp. The neighbors are invited. The white snow still lies on the ground except on the warm spot about the camp. The tree branches all show plainly in the light of the fire, which sends its red glare far into the darkness. The fire lights up the shanty, the hogsheads, the buckets on the trees, and the group about the boiling kettles, until the scene is like something taken out of a fairy play.

At these sugar parties, everyone is supposed to eat as much sugar as possible, and those who are practiced in it can eat a great deal. At the "sugaring off" they pour the hot sugar upon the snow, where it hardens without turning into sugar. It becomes a sort of wax which, I suppose, is the most delicious stuff that was ever invented. And it takes a great while to eat it. If one should close his teeth firmly on a ball of it, he would be unable to open his mouth until the wax dissolved. The feeling while it is melting is very pleasant, but one cannot talk.

The boy makes a big lump of wax and gives it to the dog, who grabs the wax and closes his jaws on it, as dogs will on anything. It is funny the next mo-

ment to see the look of surprise on the dog's face when he finds that he cannot open his jaws. He shakes his head, sits down, runs round in a circle, and dashes into the woods and back again. He does everything except climb a tree and howl. It would be such a help to him if he could howl! But that is the one thing he cannot do.

Charles Dudley Warner

Can You Arrange Steps in Order?

The steps in making maple sugar are given in the following list. If you arrange these steps in order, you are organizing a part of this lesson. Number your paper from 1 to 13. Find the first step, and copy the letter that is before it after number 1. Can you arrange the rest of the steps in order?

a. Hanging the buckets under the spouts
b. Gathering the sap
c. Dipping the liquid from kettle to kettle
d. Tapping the trees
e. Getting the hogsheads ready to hold the sap
f. Taking the sirup out to cool and settle
g. Boiling the sap
h. Driving the spouts into the trees
i. Clearing the camp of snow
j. Sugaring off
k. Setting up the kettles and building the fire
l. Scalding the sap buckets
m. Covering the shanty with branches

How Carefully Do You Read?

When you have finished reading a sentence, do you have a clear idea of what it means? See how well you understood and remembered the meaning of sentences in this lesson.

First number your paper from 1 to 10. For each of the following statements, write *Yes* if it is true, or *No* if it is not true. Then for each of the statements, find a sentence in the lesson that proves that you understood and remembered correctly. *Do not write in this book.*

1. There is still snow on the ground when maple sugar is made.
2. When the spout is first driven into the tree, the sap pours out.
3. The sap is boiled in large kettles.
4. A hired man starts a fire under the kettles every morning.
5. The boy helps in cutting wood and gathering sap.
6. Once in every two or three days the sirup is sugared off.
7. The boy tests the sap by tasting it.
8. He boils potatoes in the hot sap.
9. When the sirup is poured onto the snow, it turns to sugar.
10. The dog howls when he bites into the lump of wax.

How to Remember What You Read

People read for many different reasons. Sometimes it is just for fun or to answer a question that interests them for the moment. In such cases it may not be worth while to study very carefully or to try to remember much of what is read. But at other times people read for more serious purposes. Many of the lessons that are studied in school tell about things that are very important. Such lessons should be read thoroughly, so that the facts will be clearly understood and remembered.

Many experiments have been carried out to discover how much people understand and remember of what they read. These experiments show that when a new and difficult lesson is read only once, very little of it is remembered even for a day. Sometimes the facts in a difficult lesson are not understood at the very time they are read.

The men who have made these experiments have learned much about how to read. They say that if you wish to remember what you read, you should do the following things:

I

Decide, as you read a lesson, what facts are important enough so that they should be remembered. Many pupils waste time by trying to remember parts of their lessons that are not important.

II

Keeping in mind the advice that you are to remember only the most important things, study by the following steps:

Step 1. Be sure that you know why you are reading a lesson. Sometimes your book tells you what to look for as you read. Sometimes you have to decide for yourself what you are looking for.

Step 2. Read the first paragraph. Decide whether there is any fact in the paragraph that should be remembered. If so, be sure that you understand what the paragraph tells about this fact. When you are sure that you understand what is told, ask, "What question about this fact does this paragraph answer?" It is a good plan to write that question on a piece of paper. Do the same things for each paragraph that you did for the first one.

Step 3. When you have read your lesson through, try to answer each of the questions that you have written.

Step 4. Then turn to the lesson and read again to see whether or not you remembered all the important information. If there is any part that you did not remember, study that part carefully.

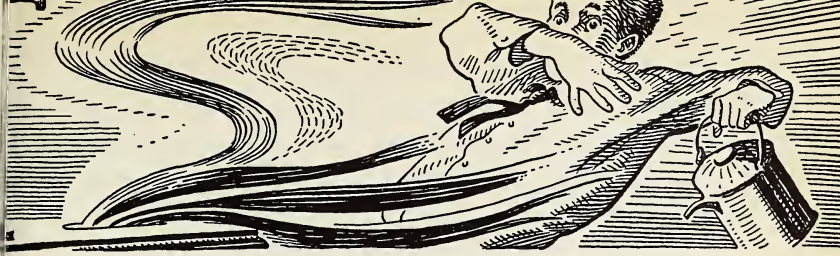
Step 5. Even when you can answer all the questions correctly, it pays to go over them several times to fix the facts in your mind. Pay special attention

to the questions that you were not able to answer correctly the first time.

Step 6. Save the questions and go through Steps 3, 4, and 5 several times during the next week. If the facts are very important, go over them again in a month or two.

This method of studying a lesson gives much better results than just reading it over and over. No step should be omitted. Many pupils, however, stop with reading the lesson and do not try to pick out the important facts or to understand them. Neither do they ask questions about these facts. When a lesson is important enough to be remembered, it is not enough to do only Steps 1 and 2. At least half the study period should be spent in trying to recall, or bring back to mind, the important facts; in checking the recall by reading again; and in studying again the parts that were not remembered. You can see that studying a lesson requires more work than just glancing through the paragraphs.

The lesson that follows is one of those important lessons that should be studied carefully. It tells many facts that should be learned so thoroughly that they will never be forgotten. Study this lesson according to the directions that are given above. Do the first five steps today. Remember in Step 2 that it is a good plan to write the questions.



Burns

Accidents may happen to anybody, but children are more likely to suffer from some kinds of accidents than from others. Burns are the most common kind of accident among children from five to sixteen years of age. They are especially common for children under five. So it is very important that everyone should know as much as possible about burns.

This lesson tells four things: first, how children get burned; second, how to keep from getting burned; third, what to do when clothing catches fire; and fourth, how to care for burns.

Children burn themselves in many ways. They touch stoves or fall against them. Little children scald themselves by pulling teakettles or pans of hot water off stoves. All children are in danger of setting fire to themselves and their clothing if they play with matches. Sometimes they do not watch where they are going, and get too near bonfires or fall into open fireplaces. Many accidents come from careless play with firecrackers or fireworks. Often boys and girls,

and grown-ups as well, are burned from trying to start fires with kerosene or from pouring kerosene on a lighted fire. These burns are bad enough, but when someone mistakes gasoline for kerosene and uses it to build a fire, the person gets terribly burned.

Burns do not just happen. They are caused by something or someone. Most of the accidents in which children get burned could be prevented. You may have heard the old saying, "An ounce of prevention is worth a pound of cure." This saying is certainly true of burns. Any burn is painful; some burns are very serious. Sometimes people die from very bad burns. So it is very worth while for all boys and girls to know about burns, because they can do much to keep themselves and others from getting burned. How shall they go about it?

Among the important things to remember are these:

1. *Do not play with matches.*
2. *Do not play with fire.*
3. *Do not get too close to bonfires or fireplaces.*
4. *Always be careful near hot stoves.*
5. *Be careful when handling kettles or pans of hot water.*
6. *Never start fires with kerosene or gasoline.*
7. *Help other children, especially younger ones, to follow these rules. It is very important never to leave hot pans, skillets, and kettles where little children can reach them.*

But what if an accident does happen and your clothing catches fire? Do not run. You may want to run, but running only fans the flames and makes the fire burn faster. Try to smother the flames. A woolen blanket or rug is best for this purpose. If there is one within reach, wrap yourself tightly in it, taking great care to keep the flames away from your face. Cotton is not so good to smother flames as wool, because cotton burns easily and usually only adds fuel to the flames. If there is nothing near in which to wrap yourself, roll on the ground, or tear the burning clothing off as quickly as possible.

If you do burn yourself, what then? The main thing is to keep air away from burns. Cover the burn with something oily, such as olive oil or vaseline. When nothing better can be found, use cream or a paste made of water and baking soda. Never bandage a burn tightly. Be careful, at all times, that you do not break the skin. Do not put cold water on a burn in the hope of cooling the skin. If the burn is at all serious, call a doctor immediately. That is the only safe thing to do.

Did the Directions for Remembering Help You?

If you followed the suggestions for remembering while you were studying this lesson on burns, you should be able to answer the questions on the next page. Do not turn back to the lesson to find the an-

swers until you have tried to answer each one. Then turn back to check your answers and to find any points that you did not remember.

1. Are children under five years of age more likely to get burned than older children?
2. In what ways do children often scald themselves?
3. Into what kind of open fires do children often fall?
4. How does a little child burn himself on stoves?
5. What things that children sometimes play with are likely to cause serious burns?
6. Is it safe to start a fire with kerosene or gasoline? Which is the more dangerous?
7. Could most of the burns from which children suffer be prevented?
8. What should be kept out of reach of little children?
9. Why should a person not run if his clothing catches on fire?
10. Why should a person wrap himself in a blanket or rug if his clothing catches on fire?
11. Why is cotton cloth not so good as woolen cloth to smother flames?
12. What can be done if a person has nothing in which to wrap himself to smother flames?
13. What should be put on a burn to keep the air away from it?
14. If a burn is serious, what is the safest thing to do?

Trap-Door Spiders

Understanding clearly the main idea of a paragraph is one of the main purposes of every person who reads. Good readers know how to use details in order to gain a better understanding of main ideas. Details are small important facts that help to explain the main idea and to make it more clear. They also make a lesson much more interesting. As you read about trap-door spiders, watch for the details.

---

1. There are several kinds of spiders that make trap-door nests, but the spider whose nest we most often hear about lives in southern California.

2. This trap-door spider is a large, hairy, brown-gray spider, and it has eight eyes in a little group on the front of the body.

3. The trap-door spider usually makes her nest at night by digging a hole or burrow in the wet soil with her jaws. The burrow is nearly an inch across,

and from two inches to a foot deep. It takes the spider about an hour to dig a burrow as large as a small walnut. When the soil around the burrow has dried, it is almost as hard as a brick. Then the spider lines the burrow with silk.

4. Perhaps you would like to know how the spider makes this silk. On the spider's body are four little tubes, or spinnerets, from which the silk comes. When the silk leaves the spinnerets it is a liquid. As it reaches the air it hardens and is drawn into fine threads. Have you ever watched your mother cook candy? Did she test it by holding a spoonful of the sirup in the air and letting it drop down from the spoon and lengthen out into a fine thread? The silk that leaves the spider's spinnerets hardens in much the same way as the candy sirup does. The spider keeps drawing out this liquid until she has enough silk to line her nest.

5. Then she is ready to make the trap door to her nest. She first spins a few threads across the top of the burrow. She then covers these threads with dirt, dry leaves, and moss. This makes the burrow look like the ground around it. She puts on several layers of silk and dirt to make the door thick. On the underside she spins more silk to make the door strong. With a thick hinge of silk she fastens one edge of the door to the top of the burrow. On the underside of the door she makes a little notch, to which she can hold when necessary.

6. If an enemy tries to lift the door, the spider takes hold of the notch on the underside of the door with her jaws and her two front pairs of legs. With her other two pairs of legs she presses out against the walls of the burrow. In this way she can hold the door down so firmly that enemies cannot open it without tearing it from the hinge.

7. The trap-door spider's nest protects the spider not only from her enemies but also from rain and cold. The silk lining helps to keep her warm and dry.

8. The nest forms a good hiding place where she can lie in wait for food. When she is watching to catch some insect, she opens the door just enough so that she can peep through it. Then, when an insect happens to pass by, she darts out like a flash and catches it. She carries it back to her nest, where she eats it. She sucks out only the soft juicy parts. The rest of the insect she throws away.

Can You Find the Important Details in a Paragraph?

One way to find details in a paragraph is to answer questions. It is surprising how many important details can be found in one paragraph. The main topic and questions about the details are given below for each paragraph in this lesson. Read each main topic. Then answer the questions under it.

1. Where the trap-door spider lives
   a. Is there only one kind of trap-door spider?
   b. Where does the most common trap-door spider live?
2. What the trap-door spider looks like
   a. How many eyes does the spider have?
   b. Where are these eyes?
   c. How are they arranged?
   d. What color is the spider?
   e. Is she a large spider or a small one?
   f. What kind of covering does she have?
3. How the trap-door spider digs the burrow
   a. When does she make the burrow?
   b. How wide is the burrow?
   c. How deep is the burrow?
   d. How long does it take to make a small burrow?
   e. How hard is the soil around the burrow?
   f. With what is the burrow lined?
4. How the trap-door spider spins the silk
   a. How many spinnerets does the spider have?
   b. In what form does the silk leave the spinnerets?
   c. Does it get soft when it reaches the air?

d. To what is the hardened thread compared?

e. How long does the spider keep spinning this thread?

5. How this spider makes the trap door

a. Where does she place her first threads?

b. With what does she cover the threads?

c. Why does she do this?

d. How does she make the door thick?

e. How does she make the door strong?

f. How does she fasten the door to the top of the burrow?

g. On what side of the door does she make a notch?

6. How the nest protects this spider from her enemies

a. Which side of the door does she hold firmly?

b. With what legs does she hold the notch?

c. What does she use besides her legs to hold the notch?

d. What does she do with her other pairs of legs?

7. How the nest protects the trap-door spider from bad weather

a. From what two kinds of weather does the nest protect the spider?

b. What is the purpose of the lining?

8. How the nest helps this spider get her food

a. Where does the spider stay while watching for food?

b. What kind of food does she eat?

c. Where does she eat it?

d. What part of the insect does she eat?

e. Does she save the rest of the insect?

Studying an Outline

Study the outline given below. In what ways is it like the main topics and questions given on pages 62 and 63? In what ways is it different?

Outlines are very useful. This outline helps you to organize and to remember what is told about the trap-door spider. The person who wrote pages 59 to 61 probably used an outline like this one. Can you think of any other uses for an outline?

TRAP-DOOR SPIDERS

I. One place the spider lives
II. The appearance of the spider
III. The way the spider makes her nest
    A. How the spider digs the burrow
    B. How the spider spins the silk
    C. How the spider makes the trap door
IV. The uses of the spider's nest
    A. How the nest protects the spider from enemies
    B. How the nest protects the spider from bad weather
    C. How the nest helps the spider to get her food

Do You Understand How an Outline Is Made?

Study the outline on trap-door spiders by following the directions on page 65.

1. Read the title of the outline. The title tells what the lesson is about.

2. Now read the words after I. Read the words after II, after III, after IV. These are the main headings or main points of this outline. Each main heading tells what one main part of the lesson is about. Main headings should always give the important topics the lesson contains.

3. Read the words after *A*, *B*, and *C*, under III. These are the subheadings that come under the third main topic. They are also called subpoints or subtopics. They tell three things the spider does in making her nest. Subheadings should always tell about the main heading under which they come. Are there subheadings under the first two main headings in this outline?

4. How many subheadings are there under IV? Read them.

5. Test your ability to read an outline by finding these main topics and subheadings: III, *C*; IV, *A*; II.

6. In the lesson "Trap-door Spiders," find the paragraph that tells about *I. One place the spider lives.* What is the number of this paragraph?

7. Find the paragraph that tells about *II. The appearance of the spider.* What is the number of this paragraph?

8. What paragraphs tell about III?

9. Read the paragraph that tells about III, *A*; that tells about III, *B*; that tells about III, *C*.

10. What paragraphs tell about IV?

11. Read the paragraph that tells about IV, *A*; that tells about IV, *B*; that tells about IV, *C*.

Reading a Title Page

Do you know the name of the reader that you are now using? Where can you find its name? Do you know who wrote the book? On which page can you find the names of the authors?

This information is given on the title page, which usually is the first printed page in a book. It is surprising how much information can be found on a title page.

Turn to the title page of this book. You can find the answers to the following questions there.

What is the name of this reader? The name of the book is printed at the top of the page.

Who wrote this book? The name of the author is printed below the name of the book. If there is more than one author, the name of each author is given.

What information is given about the authors of this book? Under the names of the authors there is usually some information about them. Sometimes this information tells what kind of work they do. Sometimes it tells about other books that they have written. It is important to know something about the authors of a book, for that is one way of deciding whether or not you can depend upon the information in the book.

Is the name of the artist on the title page of this book? The name of the person who drew the pictures for a book is often given on the title page.

What company publishes this book? The name of the company that publishes a book is printed at the bottom of the title page.

The names of the cities where this company has its main offices are usually printed under the name of the company. Sometimes these names are printed above the name of the company. If you wished to buy this reader, you would go to the nearest bookstore. But if you could not buy the book at a bookstore, you would probably order it from the company's office in the city nearest your home. In what cities does this publishing company have its main offices? Which of these cities is nearest your home?

Sometimes a date is given on a title page. That shows the year in which the book was printed. If there is no date on the title page, turn over the page and look for a date on the back.

The back of a title page is called the copyright page. Look up the word *copyright* in a dictionary if you do not know what it means. The date on the copyright page shows in what year the book was published. Sometimes a book is revised, or made over, and then there will be more than one date on the copyright page.

It is important to notice these dates, because they tell whether or not you can expect up-to-date information in the book. For example, you would not find the most recent improvements in airplanes described in a book ten years old. What is the copyright date of this book? Where did you find this date?

Can You Find Information on a Title Page?

Now that you have learned what is on a title page, read the title pages of your geography, your speller, and one other book. Write at the top of your paper the following headings:

Geography	*Speller*	*Other Book*

Number your paper from 1 to 8 below each of these headings. Answer the following questions about the title page of each book. Write *Yes* or *No* for each question. *Do not write in this book.*

1. Is the name of the author or authors given on the title page?
2. Is the year in which the book was published given on the back of the title page?
3. Is the title of the book given?
4. Does the title page tell the kind of work the authors do?
5. Does the title page give the name of the company that publishes the book?
6. Are the names of the cities where this company has its main offices given?
7. Is the name of the artist given?
8. Does the title page tell the number of pages in the book?

Grandfather's Reading Lesson

The grandfathers and grandmothers of many boys and girls that you know may have used the McGuffey Readers. It is even more likely that their great-grandfathers and great-grandmothers used these readers. The McGuffey Readers were first published in 1857, and for many years were used in more schools than any other readers of that time.

The reading lessons in the McGuffey Readers had two parts. The first part was really a spelling lesson. At the beginning of each lesson in those books there was a list of hard words taken from the lesson itself. The pupils had to learn to spell these words. Many a boy or girl who misspelled words in the reading lesson had to stand on the floor or stay after school as a punishment.

The second part of the lesson was for reading aloud. One pupil read the first paragraph, another the second, and so on, until the lesson was completed. If the class were large, so that there were not enough paragraphs to go round, the lesson was read all over again.

Many of the lessons also had exercises at the end. These exercises were in the form of questions which tested how well the pupils understood the lesson.

In Grandfather's school days, there were so few books that these few were studied very, very carefully. Every lesson was read again and again. When children had finished studying a book, they knew

almost all of it by heart. Many old people today can recite lessons they learned from the McGuffey Readers.

A favorite lesson from the McGuffey Readers was "The Wolf." This lesson is printed on pages 72–73 just as it appeared in one of the McGuffey Readers published in 1865.

Pretend that your class is in a country school like one of 1865. First, study the lesson to make sure that you can spell the words in the list and can read the story aloud. Second, have the spelling lesson. The words will be spelled orally. You will stand in a row, the teacher will pronounce the words, and you will spell them. Third, read the story aloud, each pupil reading in turn. Fourth, your teacher will ask the questions in the exercises, and you will try to answer them.

11. Frank then saw and felt how much happier a boy may be, by not meddling with what does not belong to him.

EXERCISES.—Why did the gardener like Frank? Why would he not admit the other boy? What did Frank learn?

LESSON IX.

trace	ax'es	earn'est	be-liev'ed
shook	dan'ger	dis-may'	de-ceiv'ed
sleeve	com'ing	de-stroy'	beau'ti-ful

THE WOLF.

1. A BOY was once taking care of some sheep not far from a forest. Near by, was a village, and he was told to call for help, if there was any danger.

2. One day, in order to have some fun, he cried out with all his might, "The wolf is coming! the wolf is coming!"

3. The men came running with clubs and axes to destroy the wolf. As they saw nothing, they went home again, and left John laughing in his sleeve.

4. As he had had so much fun this time, John cried out again, the next day, "The wolf! the wolf!"

5. The men came again, but not so many as before. They saw no trace of the wolf; so they shook their heads and went back.

6. On the third day, the wolf came in earnest. John cried in dismay, "Help! help! the wolf! the wolf!" But not a single man came to help him.

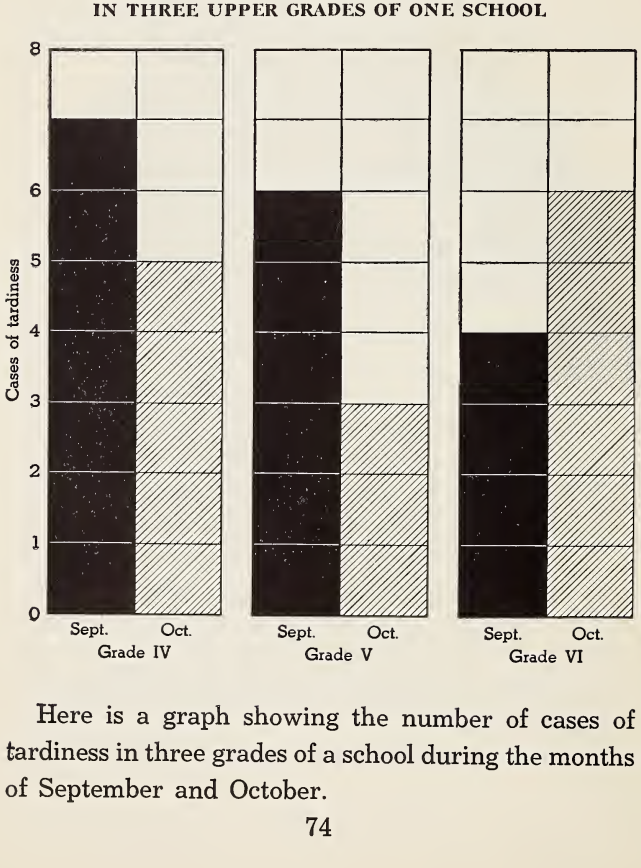
7. The wolf broke into the flock, and killed a great many sheep. Among them was a beautiful lamb, which was John's, and which he loved very much.

8. The truth itself is not believed,
From one who often has deceived.

EXERCISES.—Relate the story of the wolf. Why did not the men come the third time? What did John lose? What may we learn from this story?

Reading a Bar Graph

A graph is one kind of diagram used to compare number facts. There are several kinds of graphs. This lesson teaches you how to read a bar graph.



Here is a graph showing the number of cases of tardiness in three grades of a school during the months of September and October.

The black bars show the number of cases of tardiness in each grade during the month of September. Point to the black bars. The gray or shaded bars show the number of cases of tardiness for October. Point to the three shaded bars.

The record for three grades is shown on this graph. Which grades are they? Point to the record for the fourth grade; for the fifth grade; for the sixth grade.

The figures at the left side of the graph show the number of cases of tardiness. Each block on the graph stands for one case of tardiness.

By studying the graph you will be able to answer the following questions. Notice carefully the grade and the month in each question before you try to find the answer. Number your paper from 1 to 14 and write your answers in as few words as possible. *Do not write in this book.*

1. How many cases of tardiness did the fourth grade have in September?

2. How many cases did the fifth grade have in September?

3. How many cases did the sixth grade have in September?

4. Which grade had the fewest cases in September?

5. Which grade had the most cases in September?

6. How many cases did the fourth grade have in October?

7. How many more cases did the fourth grade have in September than in October?

8. Did the fourth grade improve its record in October?

9. How many cases did the fifth grade have in October?

10. How many cases did the sixth grade have in October?

11. Which grades made an improvement in October?

12. Which grade did not improve in October?

13. What was the greatest number of cases of tardiness in one grade for one month?

14. Which grade had half as many cases of tardiness in October as in September?

Making a Graph

Perhaps the boys and girls in your class can make a bar graph showing the cases of tardiness for two months in one or more grades in your school.

Answers to the following questions will help you in making the graph:

1. What shall you write on the left-hand side of your graph?

2. What is the greatest number of cases of tardiness made by any class?

3. What is the smallest number of cases of tardiness made by any class?

4. How many spaces high must you make your graph?

5. Where shall you write the names of the grades?

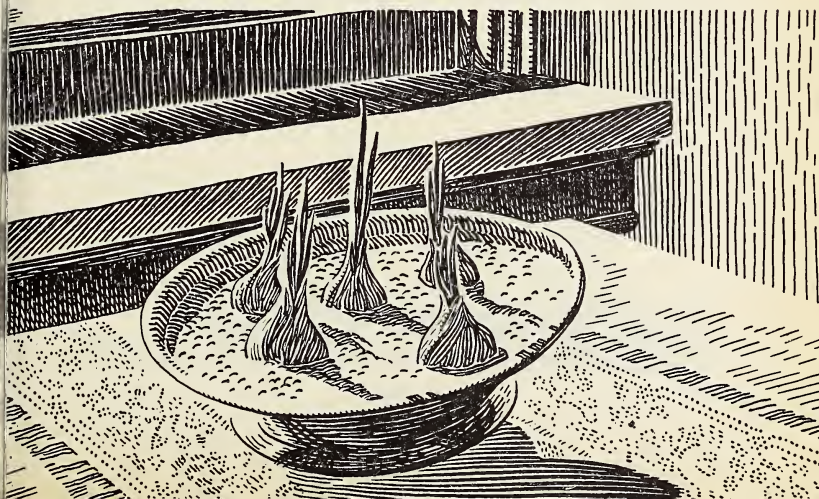
6. Where shall you write the names of the months?

How to Grow Narcissus Bulbs

If you have ever visited a flower shop, you have probably seen growing bulbs like the ones in the picture. They are the bulbs of the narcissus, which has fragrant and beautiful blossoms. People who like flowers often plant narcissus bulbs during the winter.

The narcissus grows from a bulb that looks very much like an onion. Narcissus bulbs can usually be bought in any store that sells flowers.

The narcissus is not hard to raise. Many boys and girls raise these flowers in their schoolrooms. Why do you not try to raise them? You can expect to have blossoms about ten weeks after you plant narcissus bulbs. Besides the bulbs, all that you need are some small stones, a little sand, and water. However, in order to have the best flowers, you need to follow closely the directions for planting the bulbs.



In the bottom of a deep bowl or vase put about two inches of very coarse sand or gravel. Small stones even larger than gravel may be used. Three or four small pieces of charcoal placed in the gravel or among the stones will help to keep the water sweet.

Choose the number of bulbs that will best fit the size of the bowl that you wish to use. Do not crowd the bulbs. Stand each one up straight, with the flat side of the bulb down.

Fit small stones around the bulbs so that they will not fall over. Fill the spaces between the stones with sand. This will hold the bulbs firmly in the dish.

Pour enough water into the bowl or vase to cover the sand. Put it into a cool, dark place. Be sure to keep enough water in the bowl to cover the sand.

At the end of three weeks the bulbs will have grown many roots. Then bring the bowl out of the dark and put it in the sunlight.

By planting bulbs at different times you can have flowers all winter. There are other kinds of bulbs besides narcissus that can be planted indoors. For each kind of bulb special directions for planting must be followed.

Can You Arrange Steps in Order?

Below is a list of the steps to be followed in planting narcissus bulbs. In this list the steps are not given in the order in which you should follow them. First number your paper from 1 to 11. Then read the steps. Find the step that tells what to do first and write the letter of that step after number 1. Arrange the other steps in order. *Do not write in this book.*

a. Stand the bulbs up straight in the bowl with the flat side of each bulb down.

b. Fill the space between the stones with sand.

c. Bring the bulbs into the sunlight.

d. Put about two inches of gravel in a bowl.

e. Pour enough water into the bowl to cover the sand.

f. Decide on the number of bulbs that the bowl will hold without crowding.

g. Fit small stones around the bulbs.

h. Put the bowl into a cool, dark place.

i. Leave the bowl in the dark for three weeks.

j. Place small pieces of charcoal in the gravel.

k. Keep water enough in the bowl to cover the sand.

Using an Index

An index is a list of all the important topics discussed in a book, together with the numbers of the pages upon which you can find information about these topics. The index is usually found at the back of the book. Every book does not have an index, but books that give many facts usually do.

An index will help you to locate the information quickly. Practice in looking for topics is the first step in learning to use an index. Finding topics is not difficult, because they are arranged in alphabetical order.

I. CAN YOU LOCATE PAGES IN AN INDEX IF YOU ARE GIVEN A TOPIC?

All the topics listed below are discussed in this reader and can be found in the Index. Copy the list of topics on your paper. Find the first of these topics in the Index. What pages are listed after *Courtesy*? Write these page numbers on your paper after the first topic. Find and write the page numbers for each of the following topics:

Courtesy	Hogan	Road map
Jewelry	Texas	Iceland
Wool	Picnicking	Contents

After you have found the pages for each of these topics, turn to the lessons to see if these pages tell about the topics you are looking for.

II. CAN YOU USE AN INDEX TO FIND ANSWERS TO QUESTIONS?

An index will also help you to find answers to questions. In order to do this you must first decide which is the key word of the question. The key word is the one that tells what the question is about. You look for the key word in an index in order to find the pages on which the question may be answered.

Below are eight questions that are answered in this reader. Number your paper from 1 to 8. After the number of each question write the word that you think is the key word. Look in the Index to see if it is there. If the word you chose is not there, choose another important word from the question and try to find it in the Index. For each key word find the number of the page or pages on which there is information about it.

1. What is a square?
2. Who are the Creoles?
3. For what is Harold Edgerton noted?
4. How long was the Chisholm trail?
5. What are muskmice?
6. Who was Johnny Appleseed?
7. Why is it important to notice the copyright date of a book?
8. What information is given on a title page?

If you finish before your classmates, look for the answers to the questions on the pages that you have listed.

The Tiniest of All Birds

If a paragraph is well organized, it usually answers one important question. All the facts given in the paragraph help to answer that question. As you read the following paragraphs, decide what question each answers.

I. THE LIFE STORY OF THE HUMMINGBIRD

1. The hummingbird is the tiniest of all birds. It is also one of the most unusual. Few other birds in the United States or Canada are more brightly colored. The father birds usually have the brightest feathers. Most of them have a spot of bright-colored feathers on the throat.

2. Although there are more than six hundred kinds of hummingbirds, only sixteen kinds live as far north as the United States. The most common hummingbird in the United States and Canada is the ruby-throated hummingbird, which is the only kind found east of the Mississippi River and in eastern Canada.

3. Some people believe that hummingbirds visit flowers most often in the evening. This is not true, for they like light and sunshine. Many people think one kind of moth that feeds from flowers in the evening is a hummingbird. These moths move so quickly that it is sometimes hard to tell them from the tiny hummingbirds.

4. The hummingbird eats honey and insects. It does not need to light on a plant to get its food. It can float in front of a flower by rapidly beating its wings. It dips its long bill into the cup of a flower and sucks up the honey. It also eats many tiny insects that have come to the flowers for honey. It eats insects from the leaves of plants and from the bark of trees.

5. The mother bird builds her nest in this way: She finds soft materials with which to build the bottom of her tiny nest. As she flies to the nest with dandelion seeds in her bill, she looks as if she had whiskers. She weaves these materials together with thread after thread of cobwebs. Finally, she covers the outside with mosses held in place with cobwebs. Her enemies cannot find the nest easily because the outside covering of mosses makes it look like a part of the tree itself. When it is finished, the nest is no bigger than half an eggshell and could be covered with a half dollar.

6. The mother hummingbird lays two eggs. Even before the nest is quite finished, she lays her first egg. The egg is about the size of a pea and looks like a little white pearl. In a day or two more, she lays another egg.

7. Then she sits on her two tiny eggs, waiting for them to hatch. All the time the mother hummingbird sits on her eggs, she works on the nest. She shapes it to fit her body. With her long bill, she pokes it out here and pulls it in there.

8. In about ten days the first egg hatches. Then the other one hatches, and two tiny babies, no larger than honeybees, lie in the nest. It would take six such babies to fill a teaspoon.

9. The little mother feeds her babies in a strange way. She hunts for honey from the flowers and insects from the tips of new leaves. She eats these insects and this honey herself. When this food is partly digested, she goes to her nest and flies behind a baby bird. The baby throws its head back, and the mother places her long bill down the baby's throat. She pumps the food from her own craw into the baby's. She feeds both babies each time she returns to the nest.

10. In about ten days the baby birds begin to grow pinfeathers that make them look like little pincushions. In a few more days, however, the feathers grow out. The babies grow and grow, until the nest becomes very crowded. It flattens out.

11. You may have seen baby robins get out of their nest before they were able to fly very well, but not baby hummingbirds. They take turns in learning to fly. One baby sits on the edge of the nest, stretches his wings, and combs his tail feathers with his bill. Then he tries his wings. He moves them very slowly at first, as if warming up. He makes them buzz faster and faster until he has to hang on to the nest to keep from flying away. Then it is the other baby's turn. The babies do this many times a day to strengthen their wings and to learn how to balance themselves in the air.

12. When the babies are about two weeks old, they leave the nest. They cannot fly very far at first, because their baby wings are not strong enough. It is also hard for them to eat, because their bills have not grown long enough to dip into the cups of flowers and they have not learned how to hunt insects. The mother must still feed her babies for about two weeks after they have left the nest.

13. However, the baby birds soon grow up. They learn to bathe in puddles of dew on big, flat leaves. They learn to find insects under the tips of new leaves. They learn to float on buzzing wings before flowers while they get honey and insects for themselves.

Can You Match Paragraphs and Questions?

Each of the thirteen questions below is answered in one of the paragraphs in the lesson. Letter your paper from *a* to *m*. Write after each letter the number of the paragraph that answers the question.

a. How do full-grown hummingbirds get their food of honey and insects?

b. How does the mother hummingbird feed her babies?

c. What three things do hummingbirds learn to do when they grow up?

d. What is the appearance of the hummingbird?

e. What is the only kind of hummingbird found east of the Mississippi River?

f. How large are hummingbirds when they are hatched?

g. How many eggs does the mother hummingbird lay in her nest?

h. Why do people sometimes make the mistake of believing that hummingbirds most often visit flowers in the evening?

i. What does the mother do for the young hummingbirds after they leave the nest?

j. How does the mother hummingbird build her nest?

k. How do young hummingbirds get ready to fly?

l. What does the mother hummingbird do while she sits on her eggs?

m. What happens to the nest when the babies begin to grow up?

II. HOW THE HUMMINGBIRD FLIES

1. Hummingbirds are wonderful fliers. Their small body feathers lie close and flat. Their wing feathers are long and strong. The little birds can stop quickly because their tail feathers are strong and spread out like fans.

2. These tiny birds are the only land birds that can fly backward. They can also rise straight up into the air like autogiro airplanes. Flying straight ahead, a hummingbird can easily go sixty miles an hour, which is a mile a minute.

3. Men have tried to find out how fast hummingbirds beat their wings when they fly. But their wings move so rapidly that no human eye can watch them. Some people used to think that they beat as often as two hundred times a second. Such speed would be much faster than the spinning of the propeller of an airplane.

4. Professor Harold E. Edgerton and some other engineers of the Massachusetts Institute of Technology finally invented a high-speed movie camera that has been used to take pictures of flying hummingbirds. This camera has such speed that it can clearly picture each movement of the hummingbird's wings. As many as eight hundred pictures can be made on the film every second.

5. These pictures showed Professor Edgerton that the speed of the hummingbird's wings was not nearly so great as had been thought. He found that when hummingbirds are flying they beat their wings about seventy-five times each second. When floating before a flower, they beat them about fifty times each second. Even this speed is far too great for the human eye to see.

6. Hummingbirds are able to protect themselves from their enemies because they are such good fliers and are so brave. They are among the bravest of all birds. In spite of their small size, they will attack crows, hawks, and even eagles.

7. The powerful little wings of the hummingbirds carry them far to the north in summer. Some of them go as far as northern Canada and Alaska. When summer comes to an end and winter is on the way, the hummingbirds fly south again. It does not take them long to reach their winter homes near the equator. They can fly five hundred miles across the Gulf of Mexico in one night.

Can You Choose the Main Question Answered by a Paragraph?

Below are three questions for each paragraph. All three questions are answered in the paragraph, but one of them is the question that gives the main idea. Number your paper from 1 to 7. After each number write the letter of the main question.

1. *a.* What kind of wing feathers do hummingbirds have?
   b. How can hummingbirds stop so quickly?
   c. Why are hummingbirds such good fliers?
2. *a.* How fast can hummingbirds fly?
   b. In what directions can hummingbirds fly?
   c. In what way are hummingbirds like autogiros?
3. *a.* How fast did some people think the hummingbird beats its wings?
   b. What did people want to know about hummingbirds?
   c. Why was it difficult for men to tell how fast hummingbirds beat their wings?
4. *a.* How were people finally able to see the beating of hummingbirds' wings?
   b. How many pictures could the high-speed camera take each second?
   c. Who invented the high-speed camera?
5. *a.* What did Professor Edgerton find out?
   b. How did Professor Edgerton find it out?
   c. Who proved how fast the hummingbird beats its wings?

6. *a.* What birds have hummingbirds been known to attack?
   b. How do hummingbirds compare with other birds in bravery?
   c. How are hummingbirds able to protect themselves?
7. *a.* How far north do hummingbirds go?
   b. How far south do hummingbirds go?
   c. How far do hummingbirds travel each spring and fall?

III. HOW TO MAKE FRIENDS WITH HUMMINGBIRDS

1. You can attract hummingbirds to your garden if you have plenty of flowers to furnish them with food. Hummingbirds seem to choose their favorite flowers by color. They especially seem to like to get honey from red flowers, such as red salvia, bee balm, and trumpet vines.

2. If there are hummingbirds near, you may bring them closer to your house by feeding them a sirup of sweetened water. This sirup can be put in small bottles tied with red ribbons or hidden in red paper flowers. A sirup made of one cup of sugar and two cups of water boiled together for five minutes is good food for hummingbirds.

3. One woman fed hummingbirds sirup from bottles held in her hands. The little birds learned that she was their friend and came to her without fear. Once, when

she spilled some of the sweetened water on her finger, a little bird gently licked it off. She said it was the softest touch she had ever felt.

4. A man in California who began feeding hummingbirds soon had so many hummingbird visitors that he did not have enough bottles for them. He then made twenty-four feeders much like those used by farmers to give water to their baby chickens. Now he often counts as many as thirty-six hummingbirds feeding at one time. They come from morning to night and sip up six quarts of sweetened water every day.

5. Some people in New Hampshire had thirty hummingbird feeders hung in the shrubs and about the flowers of their country house. These feeders needed to be refilled three or four times a day. Between the

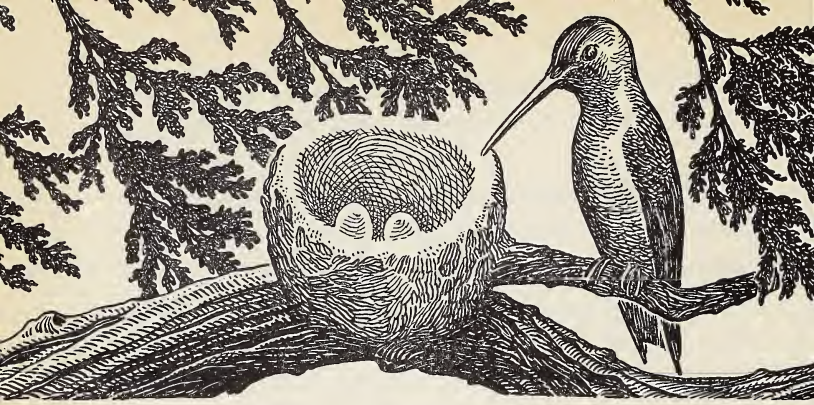
first of May and the middle of September of one year, sixty-five pounds of sugar were made into sirup to feed these little birds.

6. Another man and woman were delighted to discover a mother hummingbird building her nest on the low limb of a tree in their orchard. They watched her build the nest. They saw the two tiny eggs lying in it and waited for the little birds to be hatched.

7. The man and woman wanted to feed the little mother bird; so they put bottles of sirup into some red-paper flowers. They stuck the flowers into the ground near her nest. It was some time before the mother bird drank from them, but finally she not only drank from them herself, but also got food from them to feed her little ones.

8. One day when it began to rain, the man brought the paper flowers, with the bottles of sirup, to the porch, so they would not get wet. He stuck the wire stems into a crack in the porch floor, with the flowers resting against the arm of his chair, and then began to read. Soon there was a hum of swift wings only a few inches from his face. All afternoon the mother hummingbird kept coming to drink from the bottles fastened to the red-paper flowers.

9. From that time on, she came to the flowers for food no matter where they were put. Most of the time they were tied to a post at the corner of the porch. She seemed to think it a fine place to get food for her family. Sometimes she chirped to her human friends.



10. You too can make friends with hummingbirds by feeding them. Once you have made friends with them, you can move the bottles from which they feed to places where you can easily watch the little birds. If you have sharp eyes, you may be able to see a mother bird come and go. If you watch closely, you may get a peep at her little nest. You may even see the two tiny, pearl-like eggs if the nest is low enough. And, if you are patient, you may see the baby birds themselves!

Can You Ask the Main Question Answered by a Paragraph?

Reread the first paragraph in III. Ask a question about the most important idea in that paragraph. Ask your question in such a way that knowing the facts in the paragraph will help you to answer it. Ask the main questions answered by the other paragraphs in III.

What a Dictionary Tells about Words

The dictionary is a very useful book. It tells how words are spelled, how they are pronounced, and what they mean. To get the most out of your dictionary, you must know how to use it. You must know how to find words in the dictionary, and you must be able to understand what the dictionary tells about them.

An exact copy of a page from a dictionary is given on the next page. This sample page shows many things you must understand in order to use the dictionary well. Some of them are explained below.

1. Guide Words

You have already learned that words in the dictionary are arranged in alphabetical order. The two words in heavy black print at the top of each page of a dictionary are called guide words. Find the guide words on the dictionary page given in this lesson. The guide words show you whether or not the word that you are looking for is on that page. If you know alphabetical order, the guide words tell you quickly whether the word you are looking for comes before that page, on that page, or after that page. The left-hand guide word is the same as the first word on the page. The right-hand guide word is the same as the last word on the page. Find the first and last words on the dictionary page. Are they the same as the guide words?

gov'ern (gŭv'ĕrn), *v.* **1.** To direct; to control; to manage; as, to *govern* a country; to *govern* one's temper. **2.** To determine; to decide; as, his feelings *governed* his choice. **3.** In grammar, to require the use of a particular case of a word; as, a preposition *governs* the objective case.
gov'ern·a·ble, *adj.* **gov'ern·ance,** *n.*

gov'ern·ess (gŭv'ĕr·nĕs), *n.* A woman who teaches and cares for a child.

gov'ern·ment (gŭv'ĕrn·mĕnt), *n.* **1.** Control; direction of the affairs of a city, a nation, etc. **2.** The method or system of control; the established form of political rule; as, a democratic *government.* **3.** The country that is governed. **4.** The person or persons who govern. — **gov'ern·men'tal** (gŭv'ĕrn·mĕn'tăl), *adj.*

gov'er·nor (gŭv'ĕr·nĕr; gŭv'ĕ·nĕr), *n.* **1.** A person who governs; especially, the chief executive of a State of the United States, or of a British colony. **2.** A device in an engine, etc., for regulating its speed. — **gov'er·nor·ship',** *n.*

Student in Cap and Gown.

govt. Abbreviation for *government.*

gown (goun), *n.* **1.** A woman's outer dress. **2.** A loose robe. **3.** A loose robe worn by scholars, priests, etc. — *v.* To clothe in a gown.

gr. Abbreviation for *grain* or *grains.*

Gr. Abbreviation for *Greece* or *Greek.*

grab (grăb), *v.;* GRABBED; GRAB'BING. To snatch; to seize. — **grab,** *n.*

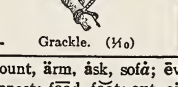
grace (grās), *n.* **1.** Kindness; good will; favor; as, to be in our good *graces.* **2.** A short prayer at a meal; as, to say *grace.* **3.** A sense of what is right or proper; as, he had the *grace* to confess. **4.** [usually written with a capital letter, *Grace*] A title for a duke, a duchess, or an archbishop. **5.** A pleasing and attractive quality; easy, flowing action; as, there was *grace* in all her movements. **6.** The mercy of God; divine favor. **7.** ***the Graces.*** In Greek mythology, three beautiful maidens, who were regarded as giving charm to wisdom, love, and social life. — *v.* To adorn; to honor; as, the table was *graced* with flowers.

grace'ful (grās'fo͝ol), *adj.* Showing grace.
grace'ful·ly, *adv.* **grace'ful·ness,** *n.*

grace'less (grās'lĕs), *adj.* Lacking grace, goodness, etc.; hence, bad; as, a *graceless* lad.

gra'cious (grā'shŭs), *adj.* **1.** Attractive in appearance or character. **2.** Kindly; beneficent.
gra'cious·ly, *adv.* **gra'cious·ness,** *n.*

grack'le (grăk'l), *n.* A large blackbird with shiny feathers that show changeable green, purple, and bronze colors.


Grackle. (1/10)

gra·da'tion (grā·dā'shŭn), *n.* A gradual passing from one size, color, shade, degree, etc., into another.

grade (grād), *n.* **1.** Position in a scale of rank, of quality, or of order; as, he held a high *grade* in the army. **2.** A class of things that are of the same rank, quality, or order. **3.** A division of the school course that represents one year's work. **4.** The group of pupils in such a division. **5.** [used in the *plural,* GRADES] The elementary school system; as, to teach in the *grades.* **6.** The rate at which a highway, a railroad, etc., ascends or descends; as, a steep *grade;* also, an incline. — *v.* **1.** To arrange in grades; to sort; as, to *grade* apples; to form a series with only slight differences between grades. **2.** To make level or evenly sloping; as, to *grade* a highway.

grad'u·al (grăd'ū·ăl), *adj.* By steps or degrees; very slow or slight; as, *gradual* progress.
grad'u·al·ly, *adv.* **grad'u·al·ness,** *n.*

grad'u·ate (grăd'ū·āt), *v.* **1.** To complete successfully a course of study and be admitted to a certain honorable standing. **2.** To mark in degrees, as the scale of a thermometer; to grade. — **grad'u·ate** (grăd'ū·ât), *n. & adj.* — **grad'u·a'tion** (grăd'ū·ā'shŭn), *n.*

graft (grăft), *v.* **1.** To insert a shoot from one plant into another plant so they are joined and grow together. **2.** To join one thing to another as if by grafting. **3.** To get money, position, etc., by dishonest means. — *n.* **1.** A shoot from one plant which is grafted upon another plant; also, the act of grafting. **2.** The taking of money, etc., by dishonest means. — **graft'er,** *n.*

gra'ham (grā'ăm), *adj.* Made of ***graham*** *flour,* an unsifted wheat flour.

grail (grāl), *n.* **1.** A platter; a cup; a chalice. **2.** [written with a capital letter, ***Grail*** or ***Holy Grail***] In medieval legends, the platter, or the cup, used by Christ at the Last Supper.

grain (grān), *n.* **1.** The seed or seedlike fruit of cereal grasses, such as wheat, Indian corn, or oats. **2.** Cereal grasses or plants. **3.** Any small, hard particle; as, a *grain* of sand; hence, a tiny amount; a bit; as, a *grain* of sense. **4.** A measure of weight that forms the unit in several different kinds of weighing. See *Tables,* page 736. **5.** Fiber; the arrangement of fibers in wood, of layers in stone, etc.; texture. **6.** Temper; natural disposition; as, that goes against my *grain.* — *v.* **1.** To form grains; to granulate. **2.** To paint in imitation of the grain of wood, etc.

gram (grăm), *n.* A measure of mass and weight in the metric system, equal to 15.432 grains.

gram'mar (grăm'ĕr), *n.* **1.** The science which collects, studies, and explains facts about classes of words, their relations to each other, and their use in sentences. **2.** The manner of speaking or writing according to the rules of grammar. — **gram·mar'i·an** (grə·mâr'ĭ·ăn), *n.*

The above sample page is from *Webster's Elementary Dictionary—A Dictionary for Boys and Girls.* Copyright, 1935, by G. & C. Merriam Company, Springfield, Mass.

When you are trying to find a word in a dictionary, look at the guide words before you look at the words in the columns.

Now look again at the guide words on the sample dictionary page. Which of the following words should you expect to find on this page?

a. graceful	*d.* grape	*g.* grade
b. golf	*e.* grammar	*h.* great
c. good	*f.* gradual	*i.* grasp

Which of these words should you expect to find on some page of the dictionary that comes before the sample page?

Which of these words should you expect to find on some page of the dictionary that comes after the sample page?

2. Syllables

Find the word *graceful* on the sample dictionary page. Notice that it is divided into two parts, *grace ful.* The parts into which a word is divided are called syllables. Many short words have only one syllable. It is easier to learn how to spell or pronounce long words if they are divided into syllables.

How many syllables are there in each of the following words?

a. govern	*d.* grammar	*g.* government
b. gown	*e.* gracious	*h.* governor
c. gradual	*f.* graduate	*i.* gradation

3. Accents

In pronouncing words of several syllables, one syllable usually gets more stress than the others. This extra stress is called accent. An accent mark (′) is placed after the syllable that is stressed. Look at the sample page and find out which syllable is accented in each of the following words. Pronounce the words after you have decided which syllable is accented.

a. govern	*c.* gradation	*e.* grammar
b. gracious	*d.* government	*f.* governess

Many words have more than one accented syllable. In such cases one accent mark is usually heavier than the others. Under *graduate*, find the word *graduation*. The first syllable is stressed slightly, so a light accent mark is used. The third syllable is stressed heavily, so a heavy accent mark is used.

4. Respellings

Words are often respelled to help you to pronounce them correctly. Sometimes the whole word is respelled. In some cases only a part of the word is respelled. When a word is respelled, it is spelled exactly as it sounds. How are the following words respelled? Be ready to pronounce them.

a. grace	*c.* govern	*e.* grammar
b. gracious	*d.* grain	*f.* governor

5. Key to Pronunciation

If you look at the respelling of a word on the sample dictionary page, you will see that some of the letters are marked to show their exact sounds. The ways in which these letters should be pronounced are shown by the key words at the bottom of the page. Find these words on the sample dictionary page. Look at the respelling of the word *grackle*. Look at the mark over the letter "a." Now find the key word that shows how "ă" is pronounced. Pronounce *grackle*, grăk″l.

Find the key word that shows how "ŭ" is pronounced. Find the key word for "ā"; for "ĕ."

6. Illustrations

Sometimes the dictionary has pictures to help you to understand some of the words. These pictures are called illustrations. How many illustrations are there on the sample dictionary page?

7. Definitions

One of the chief uses you can make of the dictionary is for finding the meanings of words. These meanings are called definitions. The dictionary often gives two or more definitions for a word. These definitions are usually numbered. Are they numbered on the sample dictionary page?

When you are looking up the definition of a word, read all the definitions given and then select the one definition that best fits into the meaning of the sentence in which the word is used. The sentences below contain words that are found on the sample dictionary page. For each underlined word, select the definition that best fits into the meaning of the sentence. On your paper write the letters *a* to *l*. Opposite each letter write the number of the definition that you chose. *Do not write in this book.*

a. His sister will graduate in June.

b. Nurserymen graft twigs into the roots of seedling trees.

c. Bill is in the fifth grade.

d. Horses should be fed grain when they are working hard.

e. Who is the governor of the state in which you live?

f. Mary skated with unusual grace.

g. The automobile climbed the very steep grade with ease.

h. Jim never makes a mistake in grammar.

i. A grain of sand blew into John's eye.

j. The apples from this year's crop are of a very high grade.

k. The grain of the wood shows plainly through the varnish.

l. Alice wore a beautiful satin evening gown.

More Help in Building a Vocabulary

You have learned that a dictionary tells how words are pronounced. Do you recall the four things that a dictionary tells about a word that help you to pronounce it? If not, reread quickly pages 97-99.

The words given below are used in the lesson "Materials in a Telephone." The meanings of the words are explained in the lesson, but you will enjoy your reading more and understand it better if you know how to pronounce these words. Copy this list of words on your paper in a single column. Use your dictionary to find out how each is pronounced. Follow these directions as you write the pronunciation opposite each word:

1. Write the word in syllables.
2. Put in the accent mark or marks.
3. Write the respelling if it is given.
4. Mark the letters to show pronunciation.

If everyone in your class does not have a dictionary, choose a committee to look up the pronunciations for you and put them on the board.

insulation	solder	galvanize
transmitter	cable	platinum

After you have finished reading the next lesson, you should be able to tell what each of these words means. If you wish to check your understanding of the words, look at the definitions given in the dictionary.

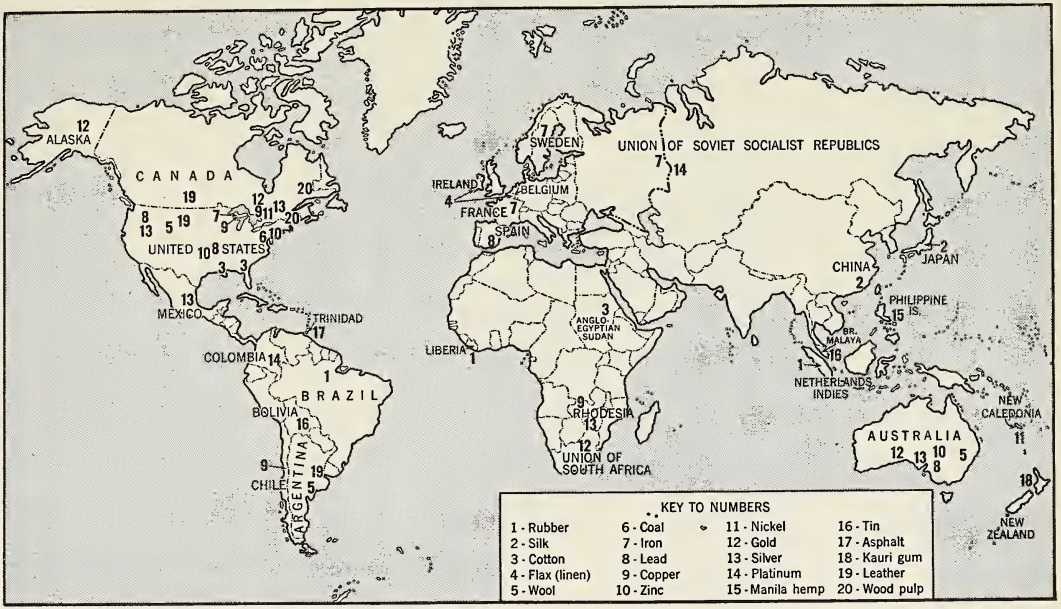
Materials in a Telephone

How wonderful it is to be able to talk over a telephone! And when we learn about a few of the many materials that are used in the nineteen and one-half million telephones in the United States, it is even more wonderful. These materials come from the far corners of the earth. Look at the map on the opposite page. Rubber from the Netherlands Indies, tin from Bolivia, gold from Alaska, linen from Belgium, and kauri (kou′rĭ) gum from New Zealand are only a few of the products that the map shows which are used in a telephone system.

Iron is used in the telephone exchange in the framework that supports the thousands and thousands of wires. It is also used in the switchboard and in many parts of the telephone itself. Iron mixed with other materials is used in the magnets and parts of the receiver. The base of the telephone is iron.

Rubber is used as a covering for the wires. Sheets of rubber are used also to make the shell of the receiver, the part of the receiver that you hold in your hand. The cap of the receiver, or the part that you hold to your ear, is molded from rubber dust.

Small, very small, grains of coal are used on the inner side of the thin sheet of metal in the transmitter. The transmitter is that part of the telephone into which you speak and which sends the message to the person with whom you are talking. When you speak,



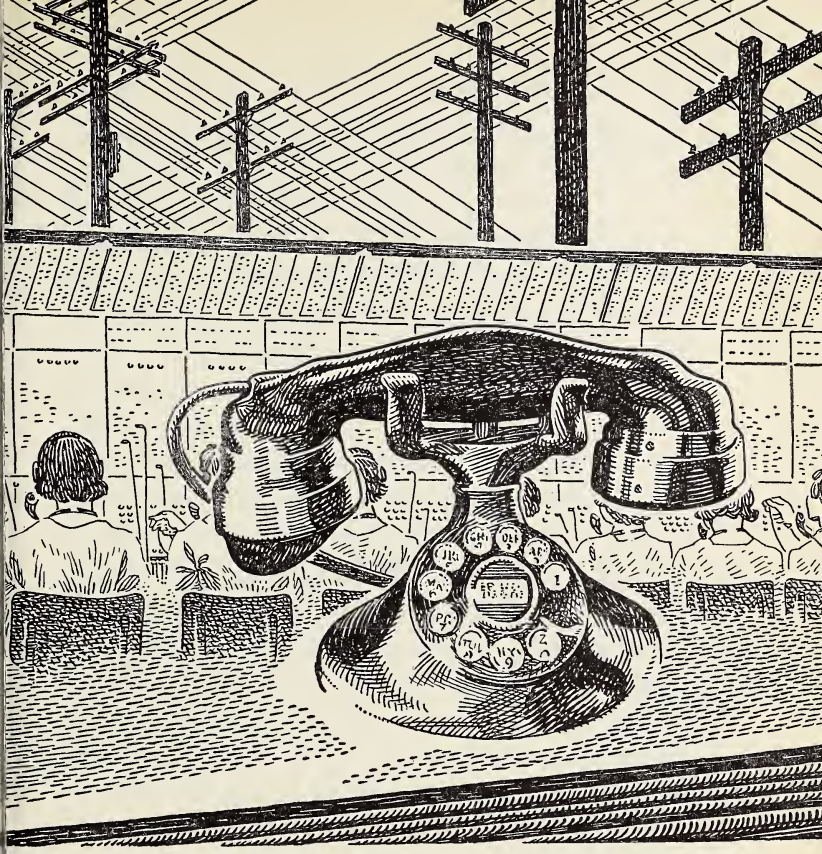
The materials used in a telephone come from all parts of the world. (After map by Western Electric Company)

the thin sheet of metal starts moving back and forth, so very slightly that you cannot see it; but the motion is enough to cause pressure on the small coal grains, which, in turn, send out electric currents along the wire. Only the very best hard coal is used in the telephone.

Sound is carried over the telephone by means of copper wires. After the connection has been made, these wires carry conversation back and forth between the people that are talking. Millions of miles of copper wire are used each year by the telephone companies. But copper is also used for other things. Wherever brass is used, copper is also used, because copper is one of the metals in brass. The springs and screws in the telephone are made from brass.

Zinc is another of the metals that is used in making brass. So wherever brass is used, not only copper but also zinc is needed. Zinc, however, has a still wider use. It is used to galvanize almost all the metal parts of a telephone system, because it makes the other metals stronger and longer lasting. Covering iron and steel with a zinc coating is called galvanizing.

Without tin, the copper wires could not be connected either to each other or to other parts of the telephone system. Tin is the solder that firmly holds together many parts of the telephone. Solder is tin or any other metal that is melted and then used to join two other metals. Copper wire is often given a coating of tin to make soldering easier.



Nickel mixes with most of the useful metals and generally makes them white and strong. When nickel is mixed with copper and zinc, it forms nickel silver or German silver, as this mixture is sometimes called. Nickel silver is used in the springs in telephones.

Because it is easily bent and does not rust, lead is used to cover the bundles of wire that you see strung

from telephone pole to telephone pole. We call the wires with the covering around them telephone cables.

Few of us realize that gold, silver, and platinum are also used in a telephone system. These precious metals are melted together and are used where certain parts of the telephone are fitted together. Although gold, silver, and platinum are expensive, they are used in the telephone because they make the parts operate more quietly. They also last longer than many other metals.

Wires that carry electricity must always be covered to protect objects near them. This covering is called insulation. Some of the materials used for insulation are cotton, silk, rubber, and wood pulp. An enamel made from one kind of asphalt and a varnish made from the gum of the kauri tree are also used for covering wires. These are only a few of the materials used for insulation.

Paper is needed in the telephone system. A sheet of linen paper in the transmitter prevents the tiny grains of coal from leaking out. The small thread in the switchboard lamp that lights up when a call comes in is made of paper. A heavy paper made from hemp rope is put around the bundles of wires that are in the lead-covered cables.

A pad of felt or leather is glued to the base of the desk telephone to prevent the scratching of furniture. Felt is wool that has been matted or pressed together. Leather is made from the hides of cattle.

Can You Follow Directions?

1. Across your paper write the following title and headings:

THE MATERIALS IN A TELEPHONE

Material	*Source*	*Use*

2. Number your paper from 1 to 20 in the column marked *Material.*

3. Skim to find the twenty materials that are mentioned in this lesson. List these materials in the first column.

4. What is the first material in your list? Find on the map one country from which it comes. Write the name of this country in the second column opposite the material. Do the same for all the materials.

5. Read again the first material in your list. Skim through the lesson to find one way it is used in the telephone system. Write this use in the third column opposite the name of the material. Do the same for all the other materials.

6. If you finish your chart on *The Materials in a Telephone* before your classmates, plan to give the following additional information:

a. Which materials come from more than one country?

b. Which materials come from the United States?

c. Which materials are used in more than one part of a telephone?

New York Herald Tribune Syndicate

Look out! Here come the nature lovers

Picnicking

When a person enters unlawfully on the property of another, we say he is trespassing. This lesson is about real people and the things they did when they picnicked. As you read, decide whether all these people trespassed.

On Mr. Brown's farm, ten miles from a small city, was a large pasture through which ran a clear little stream. The hills on one side of this stream were covered with trees and flowers. The land on the other side was level, with only a few scattered trees that furnished shade for the cows. Although the farm had many acres of fine land on which to raise crops, it was this pasture that had made Mr. Brown decide to buy the farm. He liked the trees and shrubs and flowers that grew there.

Because he liked the pasture so much, he took great pains to make it beautiful. He trimmed the dead branches out of the trees, and planted many new trees. In winter he cut down the dead ones, but he did not leave them lying on the ground. He sawed them up into wood and then stacked the wood in piles to dry for fuel.

He fenced off a part of one of the wooded hills to protect the flowers and shrubs. In this protected spot, he planted native wild flowers. When he found unusually pretty violets, Dutchman's-breeches, sweet Williams, or honeysuckle, he moved some of the plants

to this hillside, so that they could develop their seeds and multiply. He set out many flowering trees and bushes, so that in spring the redbuds, the wild crabs, and the haws filled the hillside with color. He planted bittersweet to cover the fences with bright red-orange berries in the fall.

This beautiful pasture was soon discovered by people from the city who were out driving in their cars. "What a place for a picnic!" they said, and picnic they did. From early spring until late fall, at least a dozen people visited the pasture every week. And on Sundays when the weather was good, five or six groups of people would have picnics in the pasture at the same time.

In the spring they picked or dug up the flowers, and broke off branches of the redbud and wild crab. This spoiled the shape of the trees, and decay soon started in the places where the limbs had been broken off.

In the summer parents brought their children to wade in the stream and to play in the sand along its banks. The older children and the grownups played ball and other games which injured the grass. When cows were in the way, the picnickers chased them to some other part of the pasture.

In the fall many people came to gather nuts. They were not satisfied to pick up the nuts that had already fallen from the trees. They climbed the trees and beat the branches or threw clubs to knock down the nuts. One family made a battering-ram of a log to bump the

trunks of the trees hard enough to jar the nuts down. The owner got very few nuts himself, and many of his best trees were badly damaged.

Other people came on the warm fall days not only to gather nuts but also to get decorations for their houses. They broke off branches of oak and hard maple trees and cut off armfuls of bittersweet vines. Sometimes Mr. Brown would see a car leaving the pasture with the back seat so full of branches of beautiful leaves and bittersweet that the people in the car had barely room to sit.

In spring, summer, and fall, many of the picnickers built fires to cook their dinners. Others who came in the evening built fires to sit around after dark while they told stories and sang. They thought nothing of using Mr. Brown's wood to build their fires. Very few of the picnickers were careful to clean up the rubbish left from their dinners. They left the ground littered with paper bags, tin cans, and orange peelings. Some picnickers even threw cans and bottles into the little stream. Often the picnickers did not put out their fires. Several times in dry weather, fires left burning spread to the dry grass and seriously damaged a part of the pasture.

Many picnickers found it much more convenient to open the gate and drive into the pasture than to leave their cars parked at the side of the road. Soon the cars made well-marked tracks in the grass. Some drivers failed to close the gate after themselves when they left,

so that when Mr. Brown came to look for his cows, he found some of them wandering along the road.

A few of the picnickers were very careful not to damage anything in the pasture. They tramped through the woods but did not break any branches from the trees. They did not pick the flowers or dig them up. When they built fires, they put them out and cleaned up the rubbish before leaving. They left their cars parked at the side of the road. Although they opened the gate to get in and out of the pasture, they closed it carefully behind them.

Even these careful picnickers did not ask Mr. Brown's permission to enter his pasture. In three years, only one person asked his permission to have a picnic there. This man wanted his children to have the fun of gathering some nuts. He not only asked Mr. Brown's permission but also insisted on paying for the privilege. His family all agreed that the nuts and the fun of gathering them were worth much more money than Mr. Brown was willing to accept.

How Well Do You Understand What You Read?

Your answers to the following questions will show how well you understand what you have read in this lesson.

1. What did Mr. Brown do to make his pasture beautiful?
2. Who came to his pasture to have picnics?

3. What harm did picnickers do
   a. in the spring?
   b. when they played games on the grass?
   c. when they came in the fall?
   d. when they cooked their dinners?
   e. when they drove their cars into the pasture?
4. How did the thoughtful picnickers act?
5. Did anyone ask permission to enter the pasture?
6. Did anyone offer to pay for the fun of gathering nuts in Mr. Brown's pasture?

Can You Make Judgments from Your Reading?

The following questions will help you to think about what you have read. Answer each question.

1. Did Mr. Brown have a right to keep people out of his pasture?
2. Should people go on picnics?
3. Was it Mr. Brown's duty to furnish a place where people from the city could have picnics?
4. Should all picnickers have been made to pay Mr. Brown a sum of money?
5. Should a city buy land where people could have picnics?
6. Did the picnickers do anything on Mr. Brown's farm that should not be allowed in a public park?
7. Should people enter a farmer's pasture without asking permission?
8. Should people pay for the right to picnic on a farmer's land?

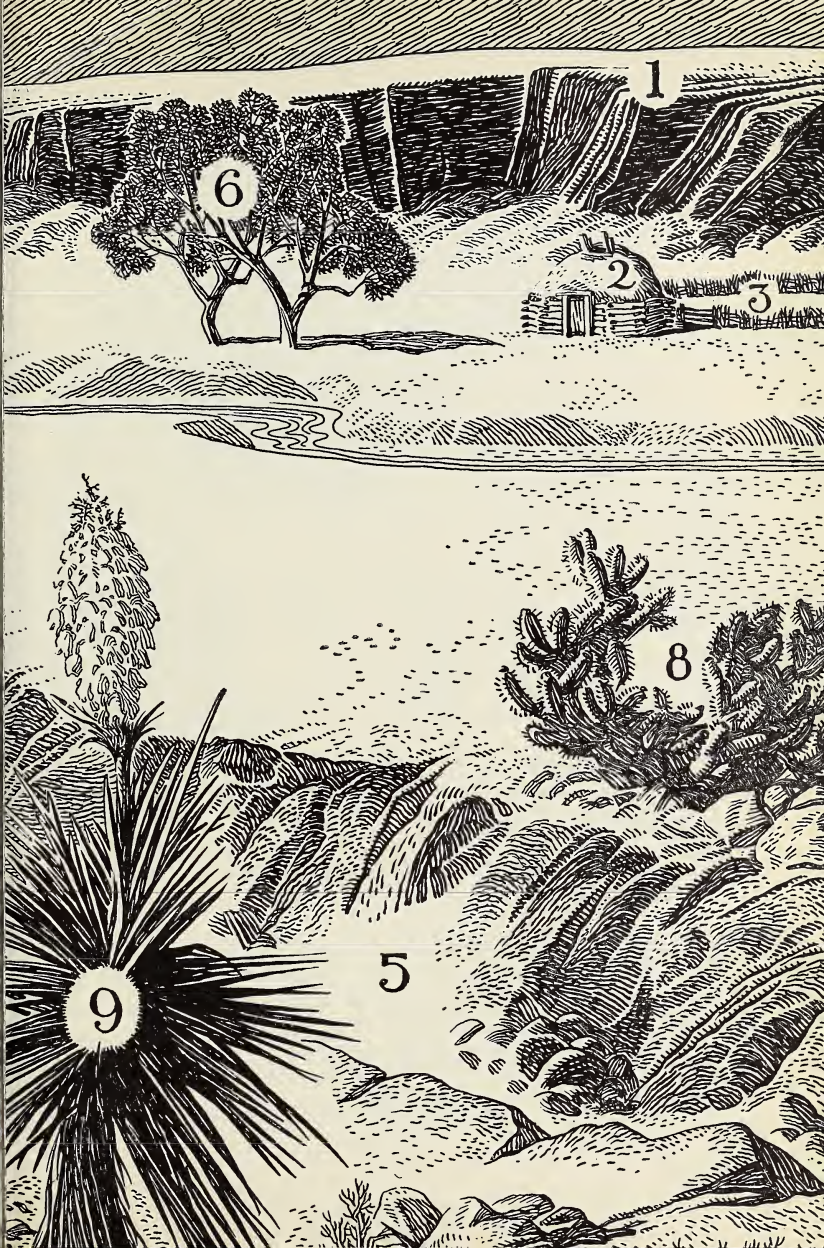
Reading Pictures

Have you ever thought how important pictures are? From the earliest times men have used pictures to tell a story, to make a record, and to help make word meanings clear. Today more than ever before, pictures are being used to help people understand the world in which they live.

It is important to be able to read a picture as well as to be able to read a page of print. The purpose of this lesson is to show you how much information you can find in pictures. It will help you to see and to understand things that are shown in the pictures on pages 115 and 117.

The first picture shows a scene in the desert; the second one shows a high slope in the southwestern part of the United States where the Navaho (năv′ȧ hō) Indians live. By understanding the things shown in these pictures, you can better understand the description of the Navaho country that is given in the next lesson.

Number your paper from 1 to 10. Read description *a* on page 116. It tells about the mesa (mā′sȧ). From the description given, locate a mesa in one of the pictures. Find the number that is placed on the picture of the mesa. It is number 1. Write *a* after number 1 on your paper. Read each of the other descriptions and put the letter standing before it after the number of the object it describes.


1
2
3
5
6
8
9

a. A *mesa* is a flat-topped hill with steep sides. Mesas are found in the southwestern part of the United States. The Navaho Indians often build their houses at the foot of a mesa in order to protect them from winds and blowing sands of the desert.

b. Aspen trees grow in the mountains. The trunks of the aspens are slender and white. Their small leaves flutter as the wind blows through the branches.

c. A *hogan* (hō′gôn) is the home of Navaho Indians. It is a round, dome-shaped house of one room. The walls are made of logs, and the domed log roof is plastered with mud.

d. Evergreens are trees that remain green during the whole year. Pine and cedar are common evergreens.

e. Cottonwood trees are often found along streams that flow through the desert. They are large trees that have rough, light-colored bark.

f. An *arroyo* (ă roi′ō) is a large ditch that cuts through the dry desert. Arroyos are usually dry, but when rains come in the mountains far above the desert, these big, dry ditches carry rushing water across the desert to rivers far away.

g. The *yucca* (yŭk′ȧ) is a plant found in the southwestern part of the United States. It has long, stiff, sharp-pointed leaves. Its white flowers grow in bunches at the top of a long stem that grows above the leaves. The roots of the yucca are dug by the Navahos and other Indians. When put in water, the roots make a rich, foamy suds. Therefore, yucca is sometimes called soapweed.

h. A *canyon* (kăn′yŭn) is a very deep valley with high, steep sides. A stream usually flows in the bottom of the canyon.

i. The *cactus* is a plant that can live in a very dry region. Its thick stems and branches are covered with spines or prickles. Many kinds of cactuses grow on the desert. Some of them are tall, but many spread or sprawl out and grow rather close to the ground.

j. A *corral* (kŏ răl′) is a pen that holds the sheep and horses after they have been driven in off the range. It is usually near the hogan.

The Navaho Indians

I. NAVAHO COUNTRY

In the first part of this lesson the author has painted a word picture of the desert. Soft reds, golden yellows, clear blue, yellow-green, gray-green, white, and silver are the colors you will see. Find the things in the desert that are these colors. Try to picture the desert in your mind.

To the Navaho Indians, their own country in northern New Mexico and Arizona is the most wonderful in the world. Yet it is mostly rough, dry desert land. Few plants grow there, but the whole region seems to be painted in beautiful colors—the soft reds and yellows of the high cliffs and mesas, and the clear blue of the sky overhead.

Mountains rise here and there, and on their slopes grow trees of pine and other evergreens. Now and then, on the higher slopes, slim, white trunks of aspen trees shoot up toward the blue sky. The aspen leaves flutter in the high breeze and make spots of dancing, yellow-green light among the dark, sweeping branches of the evergreens.

Down the mountain slopes flow streams of clear water from the springs far above the dry valley. These streams wind their ways through narrow canyons walled in by high, rocky cliffs. Finally, each winding stream of clear mountain water finds its way to join

some river that makes a shining silver ribbon, bordered with willows and cottonwoods, across the yellow desert.

Between the mountains lies the desert, which in summer is a place of strange beauty. Sprawling cactuses wear blooms of yellow and red. Gray-green sagebrush grows beside old stream beds. Scattered bunches of desert grass make patches of withered green here and there. The desert itself is marked by great arroyos, which are usually dry stream beds. These streams flow only at the few times during the year when the great rains pour down on the higher slopes and rush for miles across the waterless country to some river far away. Here and there a rutted road crawls across the desert, and smaller roads branch off from it. These lead to the homes of the Navahos.

II. NAVAHO HOMES

Before you start reading, write on a slip of paper questions about the homes of the Navaho Indians that you would like to have answered. Then read to see whether or not your questions are answered.

The homes of the Navahos are called hogans. They are round, dome-shaped houses of one room. In the center of the rounded roof of each hogan is a small smoke hole that allows the smoke to escape from the little fire built on the dirt floor of the house. Over this

fire the Navaho mother makes squaw bread, a mixture of flour, baking powder, and water, which she pats into round flat cakes and fries in hot mutton fat. She also makes mutton stew, which is the chief food of the Navaho family. The fire provides the only heat during the winter when the cold winds blow down from the snow-covered mountains and set the stinging sand to whirling over the dry plateau lands.

The hogan is built of logs cut and hauled down from the mountains, which are sometimes many miles away. The log walls are laid up in a circle. The holes between the logs are filled with mud and bark, and the domed log roof is plastered almost smooth with mud. A single doorway covered with a blanket faces the east, the direction of the rising sun.

The hogan often nestles at the foot of a high cliff or mesa, which protects it from wind and sandstorms. The Navahos always try to build their hogans near a spring or a water hole. They must have water for themselves and for their flocks of sheep and their herds

of horses. Near a good watering place there may be several hogans close together. These often are the homes of an old mother and her married daughters.

Near each hogan is a corral, a pen that holds the sheep and horses when they are driven in off the desert range. It keeps them from wandering away.

Can You Decide Whether or Not a Question Is Answered?

Some of the twelve questions below are answered in the first two parts of this lesson and some are not. Number your paper from 1 to 12. After each number write *Yes* if the question is answered and *No* if it is not.

1. In what states do the Navahos live?
2. What are the homes of the Navahos called?
3. How long does it take to build a Navaho home?
4. What materials do the Navahos use to build their homes?
5. Did the Navahos fight the white people that came to the desert?
6. Who are some of the chiefs of the Navahos?
7. What kinds of plants grow on the desert?
8. To what schools do the Navaho children go?
9. What is the main food of the Navahos?
10. Is it ever cold on the desert?
11. Who makes laws for the Navahos?
12. What kind of location do the Navahos try to find for their homes?

III. SHEEP RAISING AND BLANKETMAKING

What two industries do you expect to read about in the following part of this lesson? Decide which of the two industries each paragraph tells about.

---

1. Sheep raising is the main work of the Navaho Indians. The life of each member of the Navaho family centers around the sheep. These sheep usually belong to the Indian mother, and it is she who must take care of them most of the time.

2. Usually feed is scarce around the water holes and near the hogans; so each day the mother must take the sheep out a mile or two from her home and bring them back at night. In summer the sheep must have water every two days, in winter every four days. However, if there is snow for the sheep to eat, they do not need water to drink.

3. If a woman has children too young to be in school, she must take them with her when she is

herding her sheep. In cold weather she builds a fire in some sheltered place to keep them warm. Sometimes she takes cold bread and mutton for them to eat, but often they have no food until night.

4. If the sheep are too far away to return to the home corral at night, the mother throws down sheepskins and blankets near the fire. Here she and her children sleep in the open. If the family has sheep dogs, they help to keep the sheep from wandering away and watch over them during the night. Sometimes the father spends the night with his family. Sometimes he even does some of the herding for his wife and helps her care for the children. As the children become old enough, they do their part in herding the sheep.

5. In May and June comes the shearing season. This is a time of hard work for the entire Navaho family. A brush corral with a roof is built for the work, and the sheep to be sheared are penned near it. From dawn to dark the men's shears snip coat after

coat from the shaggy sheep, leaving their pink skins showing through a stubby covering of short wool. The women make mutton stew to feed the shearers who have come to help with the work.

6. Shearing time is not only a time for hard work, but it is a time for fun as well. Poor relatives and neighbors come to feast upon mutton and coffee and get a little wool if they help with the work. Friends drop in for a few hours to help without pay. Children have fun helping to tie the feet of the sheep being sheared.

7. One of the happiest times of the year for the Navaho family is when the traders come to buy the

wool, for the Navahos then have money to pay their debts. They buy back the jewelry that they have had to leave with the man at the trading post in order to get food before the wool was ready to sell. The trading post really is just a store where the Navahos go to trade. They buy flour and sugar and coffee there. They buy bright calico for full skirts and velveteen for bright new blouses and shirts. They may even get canned peaches and strawberry jam and oranges at the trading post.

8. However, not all the wool is sold at shearing time. If a woman is a good weaver, she saves some of the wool for her own weaving. The rough wool is saved for weaving coarse saddle blankets. The best wool is used for weaving the blankets that will be sold to the traders. The Americans who buy these blankets call them Navaho rugs.

9. After sheep-shearing time, the Navaho woman and her children go into the hills to dig the roots of the yucca plant, sometimes called soapweed. Back home again, the mother makes a foamy suds by putting the yucca roots into water. She carefully washes the wool in the suds, for it must be very clean or it will not take dye well.

10. When the wool is dry, the mother and girls comb it with wire wool cards such as our grandmothers used in pioneer days. The lumps are combed out, and the clean wool fibers all lie in the same direction in long, fluffy rolls.

11. With a hand spindle such as was used in early times, the women spin the wool into loose yarn. For good blankets, the wool must be spun two or three times. Some of the yarn, which is used to string the loom before the weaving is begun, is harder twisted, somewhat like strong twine. This makes the blanket strong and smooth.

12. Most of the Navaho sheep are white. Some, however, are rusty black and some are reddish-brown. Yarn of these colors can be spun and woven without dyeing. Gray yarn can be made by mixing the black and white wool. Jet-black yarn can be had only by dyeing the natural, rusty black. Red, the other common color of yarn used, is also dyed. The Navahos used to make their dyes from leaves and twigs and

roots. Such dyes are hard to make and take so much time that the Navaho weavers of today use dyes that they buy at the trading posts.

13. When the yarn is spun and dyed, the weaver is ready to begin work at her loom. Beside every hogan stands a large loom, and near it there are often smaller ones for the little girls of the family. While the mother weaves a blanket of many colors in beautiful designs, the little girls weave small ones of white with very simple designs.

14. A long time ago Navaho blankets were woven in plain stripes. Today, however, beautiful designs are woven into these blankets. Most of the blankets are made by the women, but some of the most beautiful ones are woven by the medicine men.

15. After a Navaho woman has finished a blanket that she wishes to sell, she takes it to the trading post. The children often go along, for a trip to the trading post is a real treat. A weaver may sell her blanket for silver money or she may take the amount in trade, which means that she takes groceries, dyes, and perhaps material for her family's clothes.

Can You Prove that a Lesson Follows an Outline?

An outline is one of the best ways of summarizing a lesson, for it helps you to organize and remember what you read. The main points and subpoints of this part of the lesson have been arranged in outline form.

If you can locate the paragraphs that tell about each part of the outline, you will see how the lesson follows an outline. Copy just the Roman numerals and capital letters in outline form. Write the numbers of the paragraphs that tell about each topic.

I. Sheep raising
   A. Herding the sheep
   B. Shearing the sheep
   C. Selling the wool
II. Blanketmaking
   A. Choosing the wool
   B. Washing the wool
   C. Combing the wool
   D. Spinning the wool
   E. Dyeing the yarn
   F. Weaving the blankets
   G. Selling the blankets

IV. NAVAHO JEWELRY

Not all details given in a lesson are worth remembering. As you read this part, watch for the facts that you think are important enough to remember.

The riches of a Navaho family are shown by the jewelry its members own. This silver-and-turquoise jewelry is made by the Navaho men, who usually are fine silversmiths. A rich Navaho thinks nothing of wearing thousands of dollars' worth of turquoise. Turquoise is a beautiful stone, usually blue, that is used

in making jewelry. Even the poorest man wears a small turquoise somewhere. It may be only a tiny bead tied in his hair, but that bead tells everyone that the owner is protected by the sacred turquoise. A Navaho believes that lightning will not strike him and that rattlesnakes will not bite him so long as he wears his little sky-blue bead.

While the Navaho mother and daughters are tending the sheep and weaving blankets on their looms beside the hogan, the father and sons are busy making jewelry. In little clay pots over a hot fire they melt Mexican silver dollars. On a piece of old railroad rail or other smooth steel, they pound the soft silver into the shapes they want. With a few simple tools they work it into silver beads, rings, and bracelets. They carefully set stones of blue turquoise and pound designs into the silver.

The family usually keeps as much jewelry as possible. However, when food is needed, the jewelry is taken to the trading post where it can be traded, just as if it were money, for the things the family must have. When wool or lambs are sold, or when fall comes and there are piñon nuts to sell, the Navahos have real money. Then they often buy back their jewelry from the trader.

Every Navaho man is especially anxious to have all his jewelry to wear when he goes to a dance or ceremony. Many Navahos come from great distances to take part in the religious ceremonies of their tribe

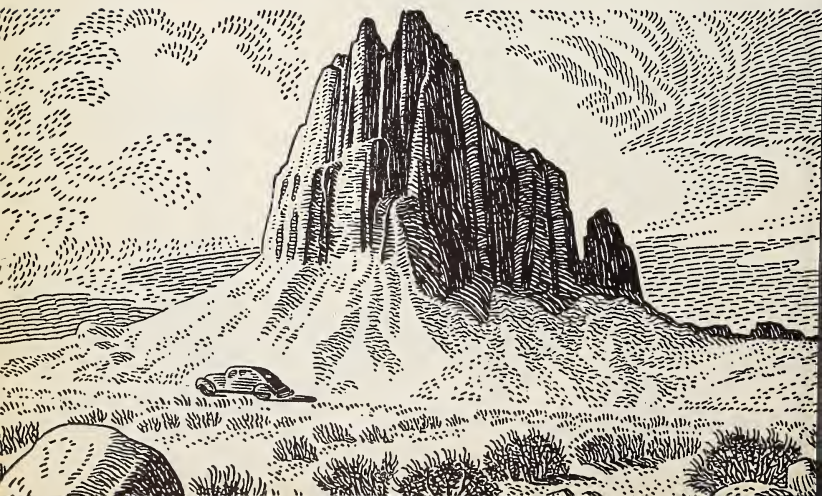
Skeeton

where they gather together to dance and sing. Only enough women and children are left behind to care for the sheep.

While the men take part in the dances, the women kill sheep and make mutton stew for the crowds of dancers. They visit with the friends and relatives whom they may not have seen since the last ceremony. But when the time comes for the Squaw Dance, the women dance, too.

After the dancing is over, the men and boys have foot races. They give rodeos, in which they do fancy horseback riding. They trade horses and turquoise, and they buy and sell jewelry.

In recent years the United States government has been trying to help the Navahos. The Navaho boys and girls are being sent to Indian schools. The boys are taught to be better silversmiths and jewelry makers.



They are also taught to build better homes. The girls are taught to be good cooks and homemakers.

Many, many years ago the United States government tried to send the Navahos to a part of the country where there was more rain, so that they could raise better crops. But the Navahos would not leave the great desert where their people had lived for so long. They liked the desert and the distant mountains, and they wished for nothing so much as to be allowed to herd their flocks of sheep in the land that had always been their home. So now white men are trying to help them to live better on this desert.

With the help of the Navahos themselves, the United States government is building roads across the desert. Wells are being made, so that there will be plenty of water for both men and sheep. Irrigation dams are being built, so that crops may be raised. The Navahos shall keep their old homes and the land shall be made to bloom for them under the turquoise-blue sky.

Kathryn Smith

How Much Do You Remember?

You will not remember everything you have read about the Navaho Indians, but you should remember some of the most important points. The questions below cover the entire lesson. Do not turn back to the reading material as you answer these questions.

1. In what states do the Navaho Indians live?
2. On what kind of land do they live?
3. On what food do the Navahos chiefly depend?
4. What materials do they use to build their homes?
5. What is a good location for the hogan?
6. What animals do the Navahos raise?
7. What kinds of work do the Navaho women do?
8. What kinds of work do the Navaho men do?
9. What do the Navahos do with the wool that they get from their sheep?
10. From what materials is Navaho jewelry made?
11. What do the Navahos buy at the trading posts?
12. In what ways is the United States government helping the Navahos to live better?
13. Are the Navahos helping to build roads and irrigation dams?
14. What are some things that Navaho boys and girls learn at the Indian schools?

If there is any question that you could not answer, turn now to the part of the lesson that answers it. Read this part carefully, and then answer the question.

Learning to Use Helpful Words

Below is a list of words that have been explained in the lessons that you have already studied in this reader. If you know them and can use them, you will often find them helpful in your reading and study. As you read the following list, think of what each word means and in which lesson it was explained.

table of contents	recall	dictionary
guide words	index	alphabetical
vocabulary	outline	graph
title page	accent	syllables
key words	illustrations	definitions

Here are sentences that give the meanings of these words. Number your paper from 1 to 15. What word should you use to fill in the blank in the first sentence? Write that word after number 1 on your paper. Match the other words with their definitions by choosing the right word for every blank. If you cannot remember what some of these words mean, turn to the lessons that tell about them and find the explanation given there. *Do not write in this book.*

1. A ___?___ is a book in which words are listed alphabetically and in which you may look to learn how to spell a word, how to pronounce it, or what it means.

2. ___?___ are the meanings of words.

3. A list of the lessons, stories, or chapters in a book and the pages on which each of these begins is called a ___?___.

4. To remember or bring back to mind is to ___?___.

5. When names or other words are listed in the order of the ABC's, they are said to be listed in ___?___ order.

6. The words that a person is able to use are called his ___?___.

7. When the important points of a lesson are arranged in the form of headings and subheadings, this arrangement is called an ___?___.

8. Words at the bottom of a page in a dictionary that show how certain letters are pronounced are called ___?___.

9. The pictures in a dictionary that help to explain the meanings of words are ___?___.

10. The first printed page in a book is usually the ___?___.

11. A ___?___ is a certain kind of diagram used to compare number facts.

12. The two words in heavy black print at the top of each page of a dictionary are called ___?___.

13. ___?___ are the parts into which words are divided.

14. The extra stress given to a syllable when pronouncing a word is called ___?___.

15. The ___?___ is an alphabetical list of the important topics found in a book.

An Index Lesson

You have learned that you can use an index to help to find the answers to questions. Suppose you wanted to answer the question "How can one make friends with hummingbirds?" What word should you look for in the index? You would look for *Hummingbirds*, which you would find written like this:

Hummingbirds, 83–94

Notice how many pages there are about hummingbirds. It would take you a long time to skim through the whole lesson to find the answer to your question. But if you will look at the Index in this reader, you will see that many topics in it are arranged in the following way:

Hummingbirds, 83–94
- appearance of, 83
- food of, 84
- kinds of, 83
- making friends with, 91–94
- nest of, 84, 86
- raising a family, 84–86
- speed of flying, 88–89
- travels of, 89

The numbers of all the pages that tell about hummingbirds are given after the first word. Below this word and indented under it are the topics, with the numbers of the pages, that tell special things about hummingbirds. These topics are called subtopics. Answer each of the questions on page 138 by studying the subtopics under *Hummingbirds*.

1. What is the first subtopic under hummingbirds?

2. On what page shall you expect to find information about the appearance of the hummingbird?

3. What is the second subtopic?

4. On what page shall you expect to find what hummingbirds eat?

5. What is the third subtopic?

6. What page tells about that subtopic?

7. On what pages shall you expect to find the answer to the question "How can one make friends with hummingbirds?"

8. On what pages shall you expect to find the answer to the question "How fast do hummingbirds fly?"

9. On what pages shall you expect to find the answer to the question "How does a hummingbird feed her babies?"

10. In what order are the subtopics arranged in this Index?

Can You Use an Index?

On page 139 are ten questions that are answered in this book. In order to find as quickly as possible the pages on which these questions are answered, you should use the Index.

Number your paper from 1 to 10. Read the first question. If you want to find which pages in the book contain information on this question, you should look first for the main topic, *Bananas*. After number 1, write the word *Bananas*. You would not, however,

need to read all about bananas to find where they are grown. In the Index, the main topic and the subtopics are arranged like this:

Bananas, 209–224
as a food, 209–210
grading of, 213
how they grow, 211–213
marketing of, 223–224
on plantations, 216–220
shipping of, 221–222
where grown, 214–215

Look at each subtopic. Which one gives the pages on which the first question is answered? The subtopic is *where grown.* Write this subtopic on your paper after the word *Bananas.* Then write the numbers of the pages that tell about this subtopic.

Now write the main topic and the subtopic for each of the other questions and the numbers of the pages on which the questions are answered.

1. Where are bananas grown?
2. How should burns be cared for?
3. What route was followed by the Pony Express?
4. What help do the Navaho Indians receive from the government?
5. How strong are whales?
6. About how many telephones are there in the United States?
7. What foods are good for building teeth?
8. How may forest fires be prevented?
9. What are the steps in catching crabs?
10. What do beavers eat?

The Stylish Rat

I. A USEFUL RAT

We think of rats as dirty, filthy creatures. We are told that they destroy millions of dollars' worth of goods and property each year, and that they carry disease as well. In most places we try to make buildings ratproof, and to get rid of the pests with poisons and traps.

In the marshes of southern Louisiana and along the low coasts of New Jersey, Delaware, and Maryland, men are doing everything they can to raise more and bigger and better rats! But there is a reason. The rat they are raising is a special kind of rat—a stylish rat!

This stylish rat is raised for his fur coat, and that fur, when it has been dyed and prepared for use, has been given many names. Men selling this fur have called it "Hudson Seal," or "Fox," or even "Ermine." They think it will sell better if people think it comes from other animals. Only lately have the men who sell this fur begun to say, "This is genuine muskrat."

Fur buyers have discovered that muskrat fur wears better and is silkier than the fur of most animals. In spite of the bad reputation of other animals called rats, women may well be proud to be wearing coats made of genuine muskrat skins, or pelts.

The muskrat is a small animal about twelve inches long, with a tail almost as long as his body. He is clothed with a thick fur that is almost waterproof. Long, stiff, glistening guard hairs on the surface protect and almost hide the beautiful, soft, thick, silky underfur. On the muskrat's back, the fur is dark brown or almost black. On his sides, it is reddish or golden brown; and underneath, it is silvery gray.

The muskrat is a native of North America and is found all the way from northern Canada to Mexico, and from the Atlantic Ocean to the Pacific Ocean. Southern Louisiana seems, however, to be an especially good home for these animals. In the broad marshes of the southern part of that state, the muskrat finds the shallow water that he likes so well. There the winters are mild, and the water never freezes. Growing there are marsh grasses that form his chief food, as well as crab, shrimp, and other small shellfish that he eats once in a while.

II. THE MUSKRAT'S HOME

Muskrat homes are built with great skill and care on the bottoms of marshes and streams. Both Mother and Father Muskrat work to build the house. They

want their living room to be out of the water. So they pile up marsh grasses, reeds, and rushes mixed with mud until they have made a thick floor that rises well above the water line. The entrance to every muskrat house is through a tunnel that runs under water. In the floor, therefore, a "plunge hole" leading to this tunnel must be made so that the muskrats can get in and out of their house.

When the floor with its plunge hole is finished, the muskrats are ready to complete the house out of materials which are close at hand. They bring in their mouths more marsh grasses, reeds, and rushes and pile them up to make a mound. They plaster these ma-

terials together with mud. As the building goes on, they shape the mixture into a well-packed, matted roof, leaving a hole to let in air.

The outer part of the house bakes hard and dry in the hot sun, but the thick layers of building material protect the inside, somewhat as the covering of a thermos bottle protects the space within. In the hottest weather the inside of the muskrat house is kept cool, while during the cold weather of winter it is kept warm. The floor has been laid well above the water line, so that the inside may be always dry. A very comfortable home this is, when it is carpeted with a soft bed of mosses and leaves and sweet-smelling grasses.

Muskrat homes are not all of the same size. Some are single houses, large enough for only one rat. Usually a small house like this is built by a bachelor rat that lives by himself. Other houses may be three or four feet high and eight or ten feet across. These larger houses are occupied by muskrat families.

After the house itself is finished, the tunnel which is to be used for entrance or exit must be dug out and deepened. Sometimes there are two or three smaller tunnels branching out from this one. They are connected with one another under water. The tunnels open into the water some distance away from the house at the bottom of the marsh, pond, or stream.

If the sloping bank of the pond or stream is steep enough to give the needed space, the muskrats may build their houses there. They dig in from the side of the bank and, as in every muskrat house, make the main entrance under water. In such a house there is an air hole above, and there may be a passageway leading to dry land.

Muskrats are good housekeepers. Dirty grass and waste materials are not allowed to collect in their houses, but are carried out into the water. The rats are clean about their bodies, too. They spend a great deal of time washing and combing their fur. Some people say that they even wash their food before eating, but there is some doubt whether that is true.

Muskrat homes need to be big and roomy, for muskrats raise large families. Mother Muskrat may have

from three to eight baby muskmice in each litter, and she has several litters each year. A litter is all the babies born at one time. In about six months these little muskrats have grown up and are having babies of their own. So in a very short time one muskrat family will have started several other families.

Can You Prove Your Answer?

Number your paper from 1 to 14. Read the statements below. Write *Yes* for those that are true and *No* for those that are not true. Find sentences in the lesson which prove that you have answered correctly.

1. The stylish rat described in this lesson is the muskrat.
2. Muskrat fur does not last so long as other furs.
3. The fur close to the muskrat's body is soft and silky.
4. There are three different colors on the pelt of a muskrat.
5. The muskrat is found only in the southern half of North America.
6. Southern Louisiana is an unusually good place for raising muskrats.
7. The chief food of the muskrat is shellfish.
8. Muskrats build their homes on the bottom of ponds, marshes, and streams.
9. The floor of the muskrat house is built first.
10. The "plunge hole" is the entrance to the underwater tunnel from the house.

11. All muskrat houses are of the same size.

12. The main entrance to every muskrat house is at the top of the house.

13. Muskrats remove dirty grass from their homes.

14. Muskmice grow to full size in about six months.

III. RAT RANCHES IN LOUISIANA

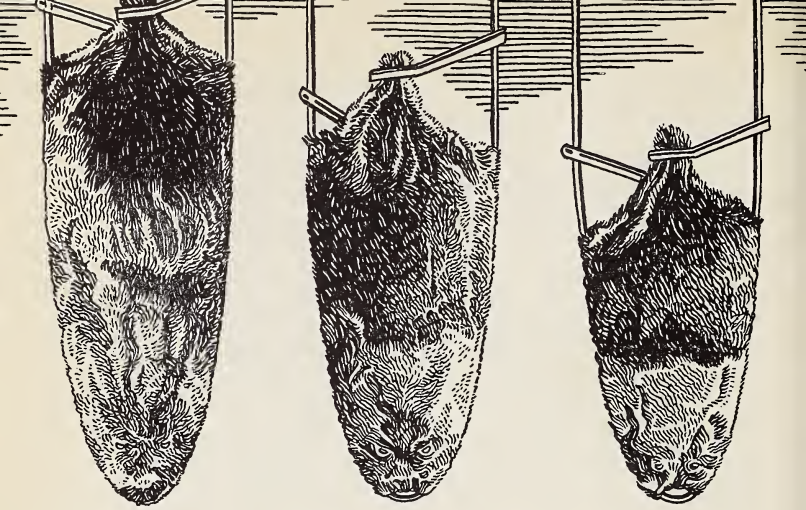
1. In the United States during a recent year twelve million muskrat pelts were made into coats, wraps, and collars. More than half of them came from Louisiana. That shows what a tremendous industry muskrat raising has come to be in that state. Thousands of acres of once useless marshlands have become valuable, as they have been turned into "rat ranches" where hundreds of trappers are employed. Some of the Louisiana trappers work for companies that own the rat ranches. Other trappers work for themselves. Large amounts of money are being spent in these marshlands in efforts to increase the muskrat catch. Other fur-bearing animals live in the marshes and swamps. The pelts of mink, raccoon, and other animals

are also taken there. But by far the greatest number of pelts taken are those of the muskrat.

2. Most of the trappers are either Creoles (krē′ōlz) or Cajuns (kā′jŭnz). Creoles are part Spanish and part French. They are descendants of early Spanish and French settlers. They speak a language that is more like Spanish than French. The Cajuns are French, descended from people who came to Louisiana many years ago after having been driven out of Canada. Their language is more like French.

3. Muskrat fur is thickest and warmest during the winter months, and at that time the muskrats are not raising their young. For these reasons the state of Louisiana has fixed a trapping season that lasts from November 20 to February 1. During this period trappers may take pelts, but at no other time in the year. The season is so short that they must work very hard during these weeks.

4. As soon as the season opens, the trapper goes out to find muskrat houses. His steel traps, which have



no bait, are set ten feet or more away from the houses. A trapper gets up before daybreak and goes out to look at all his traps. He wears hip boots and goes from place to place in a dugout, a kind of canoe which is "dug out" or hollowed out of the trunk of a tree. If all his traps are set near his home, he may come back home every night. But if traps are set too far away, the trappers work from camps, groups of little shacks set out right in the swamps, where they can stay for several days at a time.

5. After a trapper has visited all his traps and collected the rats, cleaned the traps, and set them again, he still has a full day's work ahead of him. He must carefully skin each rat and put the skin on a drying frame. This frame is a kind of stretcher, sometimes made of wood and sometimes of metal.

6. A day's catch varies from year to year. In 1927, which was an especially good year for taking muskrats, some trappers came in at the end of the season with the report that they had taken as many as a hundred pelts a day. But in many places today a trapper has made a good day's catch if he brings in twenty skins.

7. After the skins are dried in the open air, the trapper sells them to fur buyers, who sometimes come right out into the marshes in boats and do their buying there. The amount of money a trapper receives for each skin depends on the quality of the fur. The average price of a pelt is about a dollar, but some pelts are worth as much as two dollars and a half apiece.

Can You Recognize the Author's Purpose?

To be able to recognize the author's purpose, you must first understand what you have read. Then you ask yourself his purpose. You say, "Why did the author write this?" Number your paper from 1 to 7. Then reread each paragraph, trying to decide why the author wrote it. On page 150 are the paragraph numbers, with statements marked *a*, *b*, and *c* for each one. One statement gives the author's purpose, and the other two are facts that help to explain this purpose. Choose the statement that best gives the author's purpose, and write its letter after the number on your paper. *Do not write in this book.*

1. *a.* To show how important the muskrat industry is in Louisiana.
   b. To tell how marshes are used in Louisiana.
   c. To compare the number of muskrats with the number of other fur-bearing animals.

2. *a.* To define Creole.
   b. To tell the language of the Cajuns.
   c. To tell who most of the trappers are.

3. *a.* To tell at what time of year muskrat fur is thickest.
   b. To explain why the trapping season is from November 20 to February 1.
   c. To tell when muskrats are not raising their young.

4. *a.* To tell how muskrats are trapped.
   b. To tell what kind of traps are used.
   c. To tell what the trappers wear and how they travel.

5. *a.* To tell the many things done by a trapper in one day during the muskrat season.
   b. To tell what a trapper does with the skins of the muskrats that have been caught.
   c. To explain how a drying frame is made.

6. *a.* To tell that a day's catch varies from year to year.
   b. To tell what is now a good day's catch.
   c. To tell that 1927 was a good year.

7. *a.* To tell about the selling of the pelts.
   b. To tell who buys the pelts.
   c. To tell the highest price paid for a pelt.

IV. THE INCREASING IMPORTANCE OF THE MUSKRAT

1. It is only in recent years that muskrat fur has become very popular. The reason for this change is connected with the dyeing industry. Much of the muskrat fur is dyed before it is made up into coats and scarfs. Before the World War not many people outside of Germany knew much about the making and using of dyes. But when the supply of German dyes was cut off, people in America began to learn how to make the special dyes needed for furs, and before long the industry of fur-dyeing moved from Europe to America. That increased at once the call for muskrat

The pelts are thoroughly washed before they are dyed

pelts, for this fur takes dye beautifully. The dyed furs looked so much like the more expensive skins of the seal, fox, and ermine that they could almost be taken for them. Now the muskrat has come into his own, and people are willing to say that their beautiful coats are made from well-matched, dyed, muskrat skins.

2. All muskrat fur is not dyed. If a pelt is to be used in its natural color, it is divided into three parts. The part of the pelt which was the back of the muskrat is put with many other such parts and is made into a garment that is dark brown or almost black. The sides of the pelts are made into reddish-brown garments, and the underneath parts are used to make garments of silvery gray.

3. Muskrats are useful not only for their fur but for their flesh as well. If you were to dine at some of the large hotels or restaurants in certain cities, you might see "marsh rabbit" listed on the menu. From its high price you would know that this was thought to be a very fine food. Yet it is only your old friend the muskrat, hiding behind another name. Muskrat meat, even under this name, is rarely sent to the large Northern cities. People find it hard to believe that the meat of any animal with the name "rat" can be good to eat. Some day perhaps the meat will not be thrown away after the skinning, as most of it is today, for that is really a waste.

4. An animal so important to industry must be protected. Of late years laws, called "conservation laws,"

have been passed in several states to protect muskrats, as well as other fur-bearing animals. These laws provide protection for the muskrats' homes, and also make the trapping season shorter. Under such laws it has been possible also to make plans for planting marsh grasses to provide more food for muskrats.

5. The furs produced in the United States today are of great value. The production is very large. It will increase if the states will assist by passing more conservation laws and giving more protection to fur-bearing animals. Figures change from year to year, but at present the United States leads the world in the amount of fur produced. Twice as many furs are said to be produced in this country as in Russia, which ranks second.

6. Of these American furs, Louisiana produces more than any other state. It has also some of the best laws for the protection of fur-bearing animals. Such protection is bound to increase fur production. Louisiana means to take care of her muskrats and her other fur-bearing animals.

How Well Can You Recognize the Author's Purpose?

Number your paper from 1 to 6. Now look at paragraph 1. Decide which of the statements on page 154 best tells the purpose of paragraph 1. After number 1, write the letter that stands for the statement you chose. Then do the same for each of the other paragraphs.

a. To tell how conservation laws protect muskrats.

b. To tell how muskrat pelts are used when they are not dyed.

c. To tell that Louisiana plans to increase the production of furs.

d. To explain why muskrat furs have become more popular in recent years.

e. To tell that the muskrat is of value for its meat.

f. To tell how the United States ranks as a fur-producing nation.

Can You Take Notes and Plan a Report?

After you have finished reading "The Stylish Rat," a group may wish to give reports about muskrats. These suggestions will help you:

1. Choose the topic you wish to report on. Then turn to the part of the lesson that tells about that topic, and read it to get the main ideas.

2. Read each paragraph separately to find the main idea in it. Write on your paper in your own words the topic which is the main idea in each paragraph.

3. Now look at each topic and say to yourself what you are going to tell about it. This does not mean for you to memorize what you plan to say. A report is usually more interesting if it is not memorized word for word.

4. Plan to use your notes as little as possible while you are speaking. Be sure that you know the meaning of every word you use, and how to pronounce it.

Choosing the Best Word

In this lesson there are twelve paragraphs that tell how some boys and girls act at certain times. After each paragraph there are four words that describe these children. One of the four words best describes the boy or girl in the paragraph. You must know the meaning of all four words in order to tell which one best describes the boy or girl. Use your dictionary to find the meaning of any word you do not know.

Number your paper from 1 to 12. For each paragraph write the word that best describes the person.

1. A little boy helped his mother. He swept the walk. He shelled some peas for dinner. He also took care of his baby brother. Which word below do you think best describes this boy?

kind · cross · helpful · strong

2. Two children had some candy. Another child came to play with them. They did not offer the third child any candy. Which word do you think best describes the two children who had the candy?

happy · selfish · pretty · kind

3. Mrs. Parks asked her children, who were playing outdoors, to get ready for dinner. They came in immediately. Which word best describes the children?

careful · angry · obedient · silly

4. A boy started a savings account at the bank. He put into the bank ten of the twenty cents he earned each week. Which word best describes this boy?

thrifty · cheerful · honest · lazy

5. Ethel and Jim came into the house. Jim threw his cap on a chair, and Ethel put her hat on the table. Which word best describes these children?

happy · cruel · cross · untidy

6. A little girl was sick for a long time. She did not complain about her suffering. She tried not to ask people to wait on her unless it was necessary. Which word best describes this girl?

careful · patient · beautiful · busy

7. Harry and Jack were playing ball near the schoolhouse. Harry threw the ball against a window and broke it. He went into the schoolhouse and told his teacher that he had broken the window. Which word best describes Harry?

strong · honest · silly · cheerful

8. John forgot his cornet. He telephoned his mother to bring it to him, because he needed it that afternoon for a lesson. He did not ask her if she were busy. When she came, he grabbed the cornet and did not thank her. Which word best describes John?

respectful · kind · ungrateful · prompt

9. Tom's mother came to visit school one day. Tom waited for his mother when school was over and walked down the stairs with her. As there was a class coming up the steps, there was not room for them to walk beside each other. Tom stepped back and let his mother go first. Which word best describes Tom?

slow · angry · polite · happy

10. One noon Bob and Bill played around the school buildings instead of going home. They played for more than half an hour. All this time their mothers were waiting for them to come home for lunch. Which word best describes these two boys?

slow · angry · thoughtless · happy

11. Bob rushed into the classroom one morning. On his desk was an envelope addressed to Donald. Bob opened the envelope and read the note that was in it. Which word best describes Bob?

happy · good-natured · courteous · meddlesome

12. Ted, who had been playing with one of his friends, was invited to eat dinner at this friend's house. When Ted's plate was passed to him, he saw that he had been served carrots. He said: "I do not like carrots. Take them off my plate." Which word best describes Ted?

polite · hungry · courteous · rude

Reading Arithmetic Problems

Many people cannot work arithmetic problems because they do not read the problems correctly. The following problems were made for a fifth-grade class. Some are one-step problems and some are two-step problems. A one-step problem is one that can be worked by using one process. A two-step problem is one that requires two processes to find the answer.

You are not to work the problems in this lesson. You are to read each problem carefully enough to answer questions about it. If you can answer the questions about a problem, you usually will be able to work it. After you have answered the questions about each problem, plan to tell the class how to work it.

Number and letter your paper as the following problems and questions are numbered and lettered. Answer each question *Yes* or *No*.

1. Telephone companies always have men ready to repair the damages to the telephone lines caused by storms. After one storm the company spent $2037.87 for new materials and $896.78 for wages. Find the cost of the damage done by this storm.

a. Are you asked to find how much the company spent to repair damages after a storm?

b. Did the company spend almost nine hundred dollars for wages?

c. Does the problem tell how long the men worked?

d. Does the problem tell how much was spent for new materials?

e. Is this a two-step problem?

2. In one year in the United States an average of 1256 telephone poles per state had to be replaced. If the cost of replacing one pole was $6.75, what was the cost of replacing poles for the forty-eight states?

a. Are you asked to find the cost of replacing poles for a certain state?

b. Does the problem tell the cost of replacing one pole?

c. Does the problem tell how many states had to have poles replaced?

d. Does the problem tell the total number of poles that had to be replaced in all the states?

e. Is this a two-step problem?

3. Jim's father kept a record of telephone calls coming into his office during January. The record read: business calls, 1387; friendly greetings, 275; calls by mistake,7. How many calls came into his office during the month?

a. Are you asked to find the total number of calls for January?

b. Shall you need to use the three numbers in order to work the problem?

c. Do you need to know how many days there are in January?

d. Does the problem tell you how many calls were made from the office?

e. Is this a one-step problem?

4. Jane's family paid $2.50 to have a telephone put into their house. Their telephone bill was $3.65 each month. Find the total cost for the year.

a. Are you asked to find the total cost of the telephone for the year?
b. Does the problem tell you what the bill was for each month?
c. Was there any cost besides the monthly bill?
d. Can you tell for how many months you are to find the bill?
e. Is this a two-step problem?

5. During one week a telephone exchange handled these numbers of calls: Monday, 5468; Tuesday, 7315; Wednesday, 6497; Thursday, 4769; Friday, 8241; Saturday, 7340; Sunday, 3108. What was the average number of calls a day?

a. Are you asked to find the total number of calls made in one week?
b. Does the problem tell the number of calls made on each day of the week?
c. Must you find the day on which most calls were made?
d. Must you know the number of days in a week?
e. Is this a two-step problem?

The Journey

This is a story of Viking days. Gudrid (go͝od′rĭd) and her brother Sigurd (zē′go͝ort) lived with Father and Grandmother in faraway Iceland. This lesson not only tells an interesting story, but gives information about the way people of Iceland lived long ago.

I. LITTLE GUDRID

Little Gudrid scampered back up the ladder to her bed in the loft. She sank into the soft down feather bed, but she could not go to sleep again. The light shone into the little window above her head and drove the sleep from her eyes.

There was no covering over the window, not even glass, for there was no glass in Iceland in those days of long ago. In the wintertime a very thin skin, taken from the lining of a cow's stomach, was stretched across the window to keep out the snow. In the summertime the window was open to let in the sunshine and drive out the dampness that stayed in the stone walls.

After a time Gudrid got up and fastened her big woolen petticoat over the window to darken her little bedroom. Still she could not sleep. The loud bawling of her little black calf had not bothered Sigurd, her brother, at all. He slept soundly, because he had been working very hard on the hillside the day be-

fore. He had been cutting the moss that grows so thick among the rocks of Iceland.

If you could see some of this moss you would wonder why anyone should bother to cut it. It looks like wilted dandelion leaves. But after it is dried and then washed several times it is—I was going to say good to eat, but I'm afraid you would not call it good. However, the people of Iceland eat it whenever other food is scarce. Gudrid's family ate it every morning for breakfast. They poured thick cream over it and liked it.

II. THE TOWN OF ERNE PILLAR

While Gudrid was eating her breakfast, Sigurd was down at the beach loading his boat. He and his father had carried down a bale of wool; some bundles of dried mutton, beef, and fish; jars of tallow and butter; and Grandmother's big yellow cheeses.

All these things had to be taken down the coast to the town of Erne Pillar (ĕr′nĕ pē′lär). Trading ships from Europe came there bringing meal, lumber, tools, and cloth to exchange for other goods.

Besides Sigurd's ship there would be other small fishing boats, loaded like his, from the coast villages of Iceland. They too would sail to Erne Pillar to meet the big ships that came from the South to trade. There might be, also, a ship from faraway Greenland.

Years before, Eric the Red, the strongest and bravest chief of Iceland, had sailed westward to Greenland. He never came back to his old home in Iceland, but he had three fine sons who often came back. They brought wool and dried fish to exchange for the things they needed and could not get in Greenland.

Eric's sons were friends of Sigurd, and he was very anxious to see them. After he and his father had stored away their load of goods, Sigurd called to Gudrid:

"Come, come, little sister. *The Little Dragon* is ready to fly!"

III. *THE LITTLE DRAGON*

Sigurd called his boat *The Little Dragon*, because it had at its prow a dragon's head carved from a piece of wood. At the ship's stern was another carved piece that looked like the tail of the same ugly dragon. The creature had but one wing, which was a square sail, made from a fine woolen cloth woven in bright stripes of red and blue.

Sigurd was very proud of his *Little Dragon.* Although it was only a small fishing vessel, not made for sailing across the deep seas, it was a very good fishing boat. It was strongly made and patterned after the famous Viking ships of Norway. And, what is more, Sigurd himself had made the boat with only a little help from an old ship carpenter who lived in the village.

"Oh, Sigurd, *The Little Dragon* looks splendid today with its bright, new sail!" cried Gudrid as she came running down to the beach.

It was high tide in the little bay where Sigurd had anchored his boat. Gudrid jumped from one big rock to another along the stone pier that reached out into the bay. When she reached the boat, she gave a great leap right into her father's arms.

"You had better go now, with the tide," Father said to Sigurd. "See, it has started to go out."

A little helpful breeze from the east puffed out the square sail, gay with its bright stripes. Sigurd steered

the boat quite close to the shore, for he did not want to be lost at sea if a sudden gray fog should settle down upon the water and hide the shore line.

IV. SIGHTS ALONG THE WAY

Gudrid was close enough to see the rivers of ice that come creeping, oh, so slowly, from the snow-capped mountains of Iceland down to the sea.

We call such ice rivers "glaciers." I don't know what Gudrid called them, but I know that she liked to look at them. They seemed to her like huge white dragons creeping down from the snowy mountains, over the brown rocks, to the blue sea.

The most exciting thing about the ice dragons, or glaciers, is the way they sometimes bark and spit a big iceberg out into the ocean. Of course, the noise is not a real bark, but a cracking and roaring sound made when a big piece of ice breaks away from the mouth of the glacier. This does not happen often, for the glacier moves only a few feet each year. Sigurd was glad that none of the glaciers they passed on their journey sent an iceberg out to meet them. The big pieces of ice make a great splash when they break off and send huge waves rolling in every direction.

Gudrid was a little sorry that she did not hear any barking from the ice dragons, but after all she did hear more pleasant sounds than the crashing of icebergs. The murmur of many waterfalls reached her

ears. The little streams made a jolly splashing as they rushed down the steep cliffs and jumped from rock to rock on their journey to the sea. The rushing, tumbling, splashing rivers did not look at all like dragons. Gudrid thought they looked like silver ribbons, fluttering in the breeze.

But the loveliest sight that Gudrid saw that morning was neither glacier nor waterfall, but a flock of wild swans. They flew right over the boat and settled down in a quiet little bay that dented the rocky coast. As they flew, they sang a low, sweet song.

"Oh, Sigurd, are the swans a good sign?" asked Gudrid.

"Yes, a fair sign, little sister, when white birds fly overhead. We shall have kind winds for our journey and good trading at Erne Pillar."

"Oh, look, Sigurd," Gudrid cried, "see, on the shore yonder! That mountain is on fire."

"That is Hekla, the smoking mountain," explained Sigurd. "Do you not remember that I went with Father last summer to the very top of Hekla?"

"I had forgotten," answered Gudrid.

"Ah," said Sigurd, "that was a wonderful sight. We looked down into the crater and saw the melted rock, bubbling and boiling like porridge in a pot. There was a great hissing of steam, as though Hekla were very angry and would have liked to shower us with melted rock, but could not do so without giving fair warning."

"Oh, were you not afraid?" asked Gudrid. "What if Hekla had given a shower without warning? What would have happened then?"

"We should never have known what happened," answered Sigurd, "but I am sure that Hekla has never thrown out melted rock without giving many warnings. It is said that the earth trembles and a great roaring can be heard over all Iceland, and even far out to sea."

"Oh," cried Gudrid as the little boat sailed swiftly past the mountain, "I'm glad we are not going near Hekla today. When shall we reach Erne Pillar, Sigurd?"

"After we have eaten the lunch that Grandmother sent along for us and after you have taken a little nap, then we may begin to look for the harbor of Erne Pillar," answered her brother.

How Much Did You Learn from Your Reading?

If you have read thoughtfully, you have learned certain facts about how the people of Iceland lived. This test will show you how well you understood and remembered some of these facts. Number your paper from 1 to 10. Choose the word or words that make each of the following sentences true.

1. (Skin · cloth · glass) was used to cover the windows in wintertime.
2. The house was built of (wood · brick · stone).

3. Gudrid's petticoat was (cotton · woolen · linen).

4. Gudrid's family ate (cheese · moss · meat) every morning for breakfast.

5. The people of Iceland sold (wool · mutton · pork · butter · linen) from the sheep they raised.

6. Trading ships from (Europe · Greenland · North America) came to Erne Pillar.

7. The sail for the boat was made from (canvas · linen · woolen cloth).

8. *The Little Dragon* was built for (fishing · carrying passengers · carrying goods for trade).

9. Because there was danger of (glaciers · icebergs · fog), Sigurd steered close to the shore line.

10. Iceland is (level · mountainous · hilly).

V. LUNCH

"A lunch! Did you say, 'a lunch,' Sigurd? Where is it? Oh, isn't Grandmother good to us!" exclaimed the little girl, suddenly beginning to feel very hungry.

Sigurd reached under the deck covering where he had hidden the lunch, so that he could surprise his sister. All neatly wrapped in a clean white cloth was the food that Grandmother had prepared for them.

Are you wondering what was in that lunch? There were no sandwiches, for the good reason that neither Grandmother nor anyone else of those long-ago days had ever heard of a sandwich.

There was bread, but it had not been sliced from a loaf. It had been baked in big, flat cakes. They were

as large as dinner plates and as thin as pancakes, and they were very dry and crusty.

Besides the bread, Grandmother had wrapped up two long strips of smoked salmon. But that wasn't all. She had put into the lunch, as a very special treat, two pickled eggs. Not the kind that we have for breakfast. They were the eggs of the wild ducks that come every spring in great flocks to the rocky islands near the shores of Iceland. They stay only long enough to raise two families of ducklings. There is a great scramble among the people of Iceland to get as many of the eggs as possible, without scaring the ducks away. The nests are built among the steep

rocks; so it takes hard climbing to reach them. That is why pickled eggs were such a treat to Gudrid and her brother.

After Sigurd had eaten his share of the lunch, he discovered that he was very thirsty. At the bottom of the boat stood a big stone jug that should have been filled that morning with spring water. It should have been filled, but it was not. Sigurd had been so excited about hiding the lunch and keeping it as a surprise for Gudrid that he had forgotten all about filling the jug.

VI. NO WATER TO DRINK!

And now there was no water to drink! When Gudrid found that the jug was empty, she became very thirsty, too. Just to look at the cool, blue water that lapped their boat made their tongues feel as dry as dust, for they knew that they would not dare drink any of the ocean water.

"What can we do? Shall we go ashore to look for a spring?" Sigurd asked.

"Oh, let's," said Gudrid, "I just cannot wait until we reach Erne Pillar."

It was not easy to find a place where they could land safely. In most places the shores of Iceland are very rocky and steep, and there are but few sheltered places where a boat may enter.

Sigurd guided his *Little Dragon* quite close to the shore. Both he and Gudrid kept their eyes wide open,

but they saw no harbor. All the while they grew more and more thirsty. They thought of the splashing waterfalls that they had seen and hoped that they might see another. But they passed no more of them.

At last they came to a small island near a rocky coast. It seemed to be only a heap of stones not much larger than their father's farm.

Sigurd steered his boat carefully through the narrow lane of water that separated the small island from the coast.

The rocky walls on either side were very steep and high, and the little boat was carried through the narrow passage on a swift current. There was no harbor there, surely, thought Gudrid. But Sigurd knew where he was going. With the help of an oar he guided his little boat close to the rocky wall of the island. After a time they came to a high arch, or hole in the rock wall. It was so big that Sigurd's boat could sail right into it.

"Oh, it is dark in here, and so cold! Let's go back!" cried little Gudrid before they had gone very far into the cave. The rushing of the black water and the roaring of the winds through the caves in the rock frightened even Sigurd just a little. However, he would not for anything have his sister think he was afraid.

"I have often heard of these caves," he said, "and have wished that I might explore them. Now I have a splendid chance to sail in for a little distance. Be-

sides, I have an idea there may be something in here worth going after."

"Is there fresh water?" asked Gudrid. "Oh, I hope so!" she added, for her thirst made her forget her fears.

"Something just as good, perhaps," said Sigurd, but his sister could not think of anything that would be half so good as a drink of water.

"Shall we go farther into this cave, little one?" asked Sigurd.

"Oh, yes," replied Gudrid, for she wondered and wondered what her brother would find in the cave.

However, Sigurd was not able to take his boat much farther into the cave, for the roof suddenly sloped down so that the sail reached the top.

"I'll anchor right here," he said. "Now I must leave you alone for a little while."

"Where are you going?" cried Gudrid.

"I'm going to jump up on this ledge and crawl back into the cave a little farther. If only I had a lighted torch I'd go to the very end of it," Sigurd answered.

It seemed to Gudrid, who was left all alone in the boat, that her brother was gone a long time. She began to be afraid that he had slipped from the ledge and had fallen into the black water. The thought of it sent something like cold shivers down her back. She put her head down upon her knees and began to cry just a little when—Wham! Something cold and soft struck the back of her neck!

SHENTON

That did not help the shivers any, but she forgot all about crying. She was too busy brushing snow from the back of her neck.

Then the little girl looked up, her eyes round as saucers. There stood Sigurd with an armful of snowballs!

"I'm sorry," he said. "I did not mean to hit you in the neck."

"Where did you get snow?" cried Gudrid.

"Back there in the cave. I had heard that there was snow in the caves of this island even in summer, and I thought of it today when we were looking for something to drink. Here is another snowball. Put it into your mouth instead of the back of your frock," said Sigurd.

Gudrid took his advice. She crammed the snow into her mouth. How good it tasted and how cooling to her tongue!

Sigurd jumped down beside his sister, and he too began to munch snowballs. When he had satisfied his thirst, he crammed the rest of the snow into the water jug.

"Now, I think we had better get out of here. We have lost a great deal of time," said Sigurd.

It did not take long to get the ship back on its way. The stiff breeze from the east puffed out the sail again and sped the young traders to the safe harbor of Erne Pillar.

Florence and *Howard Everson*

Can You Arrange Incidents in Order?

If you were planning to tell this story to someone who had not read it, you would want to tell the happenings or incidents in the right order. You might even make a list of the most important incidents so that you would not forget interesting parts. Number your paper from 1 to 12. Below are twelve incidents. Which incident happened first in the story? Write the letter of that incident after number 1. Write the letters of all the other incidents in the order in which they come in the story.

a. Gudrid ate her breakfast.

b. Gudrid and Sigurd noticed the large glaciers.

c. Gudrid and Sigurd ate the lunch Grandmother had sent along.

d. Goods to be traded at Erne Pillar were loaded into *The Little Dragon.*

e. Sigurd discovered that the water jug was empty.

f. Gudrid saw a flock of wild swans fly over them.

g. Sigurd sailed the boat into a cave.

h. Gudrid woke up and could not go back to sleep.

i. Sigurd brought snowballs back to the boat.

j. The Little Dragon set sail as the tide started to go out.

k. Gudrid and Sigurd watched the shore for a waterfall and a harbor.

l. Gudrid and Sigurd continued on their way to Erne Pillar.

Save Our Forests

The forests of every country are of great value, and most governments do all that they can to protect them. In the United States and in Canada special divisions of the government, employing hundreds of men, work to save the forests. Many of these men work in offices and experimental stations, where they study the problems of forest conservation. Others work in the forests, where they protect the trees from their enemies. However, these men alone cannot save the forests. They need the help of all the people.

The next four lessons give information on saving the forests of the United States. You will get this information by reading a card, a table, two graphs, and a poster. In order to get as much information as possible from such helps as these, it is necessary to know how to use them.

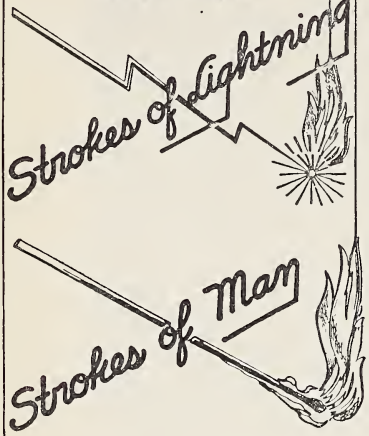
I. READING A CARD FOR INFORMATION

On page 180 you will find copies of the front and back of a card that is sent out by the Forest Service of the United States Department of Agriculture. Many people do not know how to read such a card. They get only a very little of the information that is on it.

First of all, it is a good idea to notice who puts out the card or poster that you are reading. You can then decide whether or not the information on it is likely to be valuable.

THE CAUSES OF FOREST FIRES

JUST TWO!



FIRES CAUSED BY LIGHTNING CANNOT BE PREVENTED

FIRES CAUSED BY MAN CAN BE PREVENTED BY CONSTANT CARE WITH MATCHES, CIGARETTES, AND CAMPFIRES

1. BREAK YOUR MATCH IN TWO BEFORE YOU THROW IT AWAY

2. MASH OUT THE GLOW OF YOUR CIGARETTE OR PIPE TOBACCO

Observe these rules

1. MATCHES—Be sure your match is out. Break it in two before you throw it away.

2. SMOKING—Smoke only while stopping in a safe place clear of all inflammable material.

3. TOBACCO—Be sure that pipe ashes and cigar or cigarette butts are dead before throwing them away. Never throw them into brush, leaves, or needles.

4. MAKING CAMP—Before building a fire scrape away all inflammable material from a spot 5 feet in diameter. Dig a hole in the center and in it build your campfire. Keep your fire small. Never build it against trees or logs or near brush.

5. BREAKING CAMP—Never break camp until your fire is out—dead out. Always leave a clean camp.

6. HOW TO PUT OUT A CAMPFIRE—Stir the coals while soaking them with water. Turn small sticks and drench both sides. Wet the ground around the fire. If you can't get water stir in dirt and tread it down until packed tight over and around the fire. Be sure the last spark is dead.

7. BRUSH BURNING—Never burn slash or brush in windy weather or while there is the slightest danger that the fire will spread.

8. PUT OUT any small fires you can, report others to the nearest ranger or fire warden.

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

M-5206 ore 16—5316

How Much Information Can You Get from This Card?

Answer the following questions in as few words as possible.

1. Who sends out this card?
2. What are the two main causes of forest fires?
3. Which cause of forest fires cannot be prevented?
4. Which cause can be prevented?
5. What three things should people be careful about in order to prevent forest fires?
6. What two things should be done with a match before it is thrown away?
7. What should be done with a cigarette before it is thrown away?
8. Where should people never throw pipe ashes and cigar or cigarette butts?
9. What should be done before building a campfire?
10. Where should a campfire be built?
11. What size should a campfire be?
12. What are the two things that can be used to put out fires?
13. What are the steps in putting out a campfire with water?
14. In what kind of weather should brush never be burned?
15. What should one do if he discovers a small fire?
16. What should one do if he discovers a fire that cannot be put out easily?
17. How many main rules for saving the forests does this card give?

II. READING A TABLE FOR INFORMATION

This table gives more information about forest fires in the United States. If you read it carefully, you will understand why the United States Forest Service is trying to educate people so that they will help to prevent forest fires.

FOREST FIRES IN THE UNITED STATES (1932–1938)[1]

Years	*Number of Fires*	*Damage*
1932	166,399	$53,460,000
1933	140,722	60,275,000
1934	162,663	45,373,000
1935	140,297	32,580,000
1936	226,285	54,072,000
1937	185,209	20,669,000
1938[2]	232,229	36,888,000

How Much Information Can You Get from This Table?

Number your paper from 1 to 7. After each number write the letter that is in front of the group of words that best answers that question.

1. What is shown in this table?
   - *a.* Damage from forest fires
   - *b.* The number of forest fires
   - *c.* The number of forest fires and amount of damage from 1932 to 1938

[1] Adapted from Table #691, Statistical Abstract of the United States, 1938. United States Government Printing Office.

[2] Figures for 1938 are from the United States Forest Service, Washington, D.C.

2. For what years are facts about forest fires given?

a. Six years
b. 1932–1938
c. 1936

3. About how many forest fires were there in the United States in 1938?

a. About two thousand
b. About two hundred thirty thousand
c. About two million

4. What was the loss from forest fires for 1938?

a. Almost thirty-seven thousand dollars
b. Almost three million six hundred thousand dollars
c. Almost thirty-seven million dollars

5. In what year was the damage from forest fires the least?

a. 1932
b. 1937
c. 1938

6. The number of forest fires in 1938 was about how many more than the number in 1937?

a. About 100,000
b. About 47,000
c. About 18,000

7. From what were most of the facts taken that are given in this table?

a. A magazine
b. A geography book
c. A government report

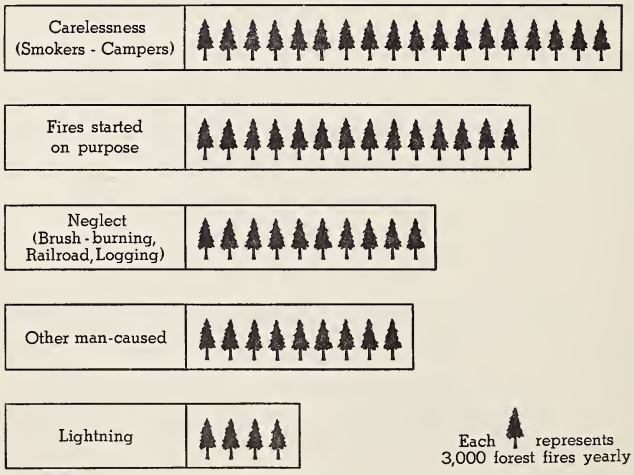
III. READING GRAPHS FOR INFORMATION

A. READING A PICTOGRAM

In the first lesson about saving our forests you learned that the United States Forest Service is trying to educate people so that they will help to prevent forest fires. From the table in the second lesson, you learned that the number of fires is large and the amount of damage to forests is great.

Now from the pictogram below you will learn the causes of forest fires. In a pictogram some picture or figure stands for a certain number. In this pictogram each picture of a tree stands for a certain number of forest fires.

Causes of Forest Fires in the United States



The key to the pictogram on the opposite page is in the lower right-hand corner. You will see by this key that each picture of a tree represents 3000 forest fires yearly. If you want to find out how many fires result from any one cause, count the number of trees after that cause in the pictogram and multiply by 3000. For example, to find how many fires were caused by lightning, multiply 4 by 3000.

Number your paper from 1 to 9. By reading the pictogram on page 184, answer the questions below. Some of the questions can be answered by merely looking at the pictogram. Others will require careful study. Write the answers in as few words as possible.

1. Under how many headings are all the causes grouped?
2. How many forest fires does each tree in the pictogram stand for?
3. What is the leading cause of forest fires?
4. About how many fires are caused by carelessness each year?
5. What two classes of people cause most fires by their carelessness?
6. What is the cause of the fires that cannot be prevented?
7. About how many forest fires cannot be prevented?
8. What three causes of forest fires are given under *Neglect*?
9. What is the total number of forest fires yearly from all causes combined?

The same information that was given on the pictogram is given on the divided bar graph below.

Causes of Forest Fires in the United States

Carelessness 54,000	Fires started on purpose 42,000	Neglect 30,000	Other man-caused 27,000	Lightning 12,000

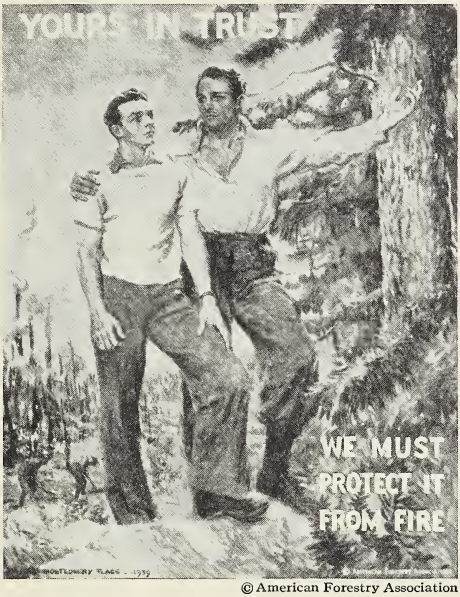
The entire bar stands for, or represents, the total number of forest fires for one year. Each section of the bar represents the number of fires resulting from a single cause. By studying the size of each section you can compare the number of fires resulting from each cause. Notice that instead of using exact figures, numbers of fires are given in thousands. Such numbers, called round numbers, are easy to read.

Number your paper from 1 to 6. Answer the following questions by reading the graph.

1. How many forest fires are caused by lightning?
2. What is the chief cause of forest fires?
3. What is the second largest cause of forest fires?
4. Does lightning or neglect cause more fires?
5. How many of the causes are the fault of man?
6. Could most, half, or a few of the forest fires be prevented?

IV. READING A POSTER FOR INFORMATION

Here is a poster that is used to remind people of the danger of forest fires. Such posters are placed in parks, camps, hotels, and sometimes along the highways.



© American Forestry Association

Does the poster give any definite facts about forest fires?

What does it tell you?

What does a poster do that a table or a graph cannot do?

Why are posters used to help prevent forest fires?

Using Cross References in an Index

An index will help you to find information about a topic. If you are planning to give a report about *Indians* and want to find material, you will probably look for that topic in the indexes of several good reference books. You might look it up in the Index of this reader. If you do, you will find this:

Indians, 13, 230, 231, 343, 365–366
See also Navahos, Ojibways, Salmon

You will find some information on the pages that are listed after *Indians*, but you will not find very much material on those pages. However, turn to *Navahos* in the Index. How many pages are there about the Navaho Indians? Find *Ojibways* in the Index. On what pages shall you expect to find information about the Ojibway Indians? Turn to *Salmon* in the Index. One part of that lesson tells about Indians. On what pages is that part?

When you looked up *Navahos*, *Ojibways*, and *Salmon*, you were using cross references in order to locate all the pages that give information about Indians. Sometimes the words *See* or *See also* are printed below a topic. The topics that come after these words are listed in another part of the Index. If you turn to these topics, they suggest other pages on which you may look for more information, just as you found a great

deal more information about Indians under the topics *Navahos*, *Ojibways*, and *Salmon*.

Can You Use Cross References in an Index?

Number your paper from 1 to 4. Below are four topics about which there is material in this book. Turn to the Index and find the first topic. Write the pages on which you will expect to find information about it. If there are cross references, find the pages on which you might find more material about this topic. Write these page numbers on your paper. Do the same for the other three.

1. Safety
2. Fish
3. Desert
4. Herding

Sometimes no pages are given for a topic, but instead the word *See* and another topic are given. If you turn to the word that follows *See*, you will find that the pages are listed after it. Below are twelve topics that are found in the Index in this book. Number your paper from 1 to 12. For each topic, write the pages on which you should expect to find information. You will need to use some cross references.

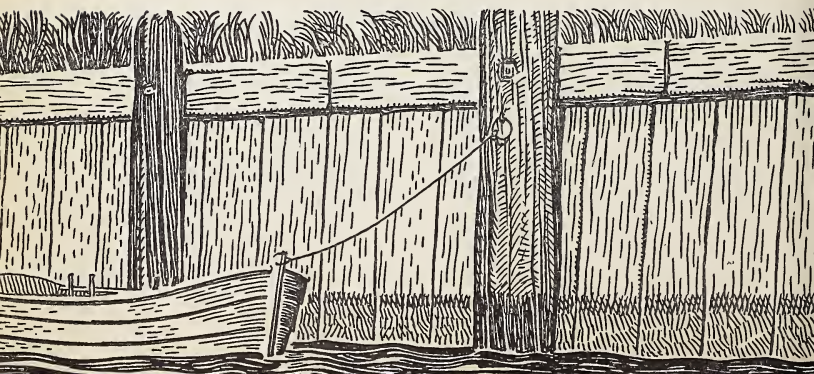
1. Birds
2. Plantations
3. Forecasts
4. Whales
5. Cowboys
6. Canning
7. Roundups
8. Narcissus
9. Picnicking
10. Sugar
11. Apples
12. Trap-door spiders

Catching Crabs

Arranging steps in order is one way of organizing a lesson. You have already had two lessons in which you were given the steps and were asked to arrange them in order. The next reading skill in order of difficulty is finding the steps yourself. As you read this lesson, watch for the steps in catching and cooking crabs.

If you live near the seashore or have visited there, it is likely that you have gone crabbing, for it is lots of fun and not at all difficult. Besides, it is a sport in which both boys and girls can take part. Let us suppose that we are going on such a trip.

We set out from home, carrying nothing except a net with a long handle, a ball of strong wrapping twine, a few odds and ends of old iron or lead to use as sinkers, and a bag or basket to bring home our catch. On our way to the shore, we shall stop at the butcher's to get a few scraps of beef or veal for bait.



A good piece of bait should be about the size of a child's fist, and the tougher it is the better. The heads of fish are also excellent bait.

When we come to the shore, we can suit ourselves about whether or not we shall use a boat. There are many crabs in most bodies of salt water, and they are as easy to find near the shore as in the deeper water. So, if our parents object to our going out alone in a

boat, or if we have no boat, it will make little difference. We can do our fishing from the pier. The crabs like to gather in the shadows under the docks and to cling to the piles.

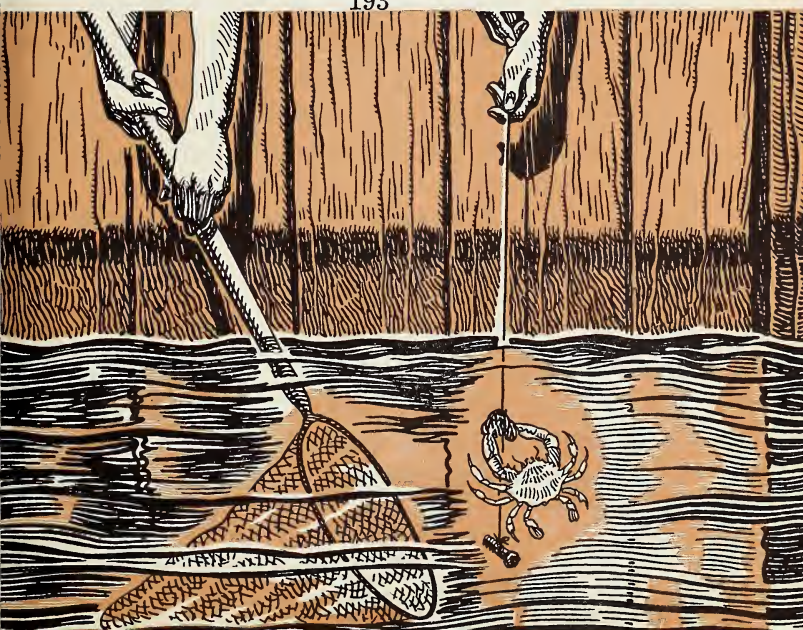
Having arrived at the shore, the first thing to do is to bait our lines. We are using no hooks, for the crab cannot swallow a hook like a fish; his mouth is too small. So we simply tie the bait on carefully to prevent its being lost. Also, we tie an old iron bolt or a piece of lead close to the bait to hold it near the bottom. Then we throw the baited end of the line into the water some distance away. It is a good idea to tie the other end of the line to something in the boat or on the dock, so that we shall not throw it completely away, or have a crab run off with it when we are not watching. Then we sit down to watch and wait. As it is not necessary to hold the line as when fishing, one person may crab with two or even more lines at the same time. Beginners, however, often work together.

For a little while nothing happens, except that the current swings the line around. But before very long, you can see that one of the lines is moving in such a manner as to make it clear that something besides the current is taking the bait along the bottom. Very carefully you pull in a foot or two of line, and sure enough, you can feel something pulling very gently at the other end. You are pretty sure that you have a crab.

If you were fishing, now would be the time to work fast, pulling in your line before the fish could get him-

self free of the hook. But with a crab you work just the other way. You must remember that the crab is not hooked; it is merely hanging on to the bait. The crab is trying to carry the meat off to a better spot where it may be thoroughly enjoyed. If you should pull your line in quickly, it would frighten the crab away or might even jerk the bait out of his claws. So you pull slowly but steadily, taking care not to jerk. In a little while the bait comes into sight near the top of the water. There, hanging on with his claws, is your crab. But you have not caught him yet!

Now you will see the reason for bringing along the net. While the crab is still four or five feet away, you stop hauling in your line and your companion reaches for the net. Very carefully he dips the net into the



water and guides it right under the crab. When he thinks he has the net placed exactly right, he lifts it suddenly. If he has been quick enough and his aim has been good, into the net goes Mr. Crab. Then there is nothing left to do but to lift him easily out of the water and drop him into the basket.

And now you will be glad that you have brought that basket or bag along. You will discover that in spite of the way the crab has acted up to now, he really is a very quick and wicked fellow when he is angry. And he is very angry at being pulled out of his watery home. It is true that he cannot bite, in the real meaning of that word, for his mouth is tiny and he has no teeth. But his claws are sharp and strong, and he can pinch most painfully. If he can get you by a toe or finger, you will wish he had not. And he can run about surprisingly fast on those fins of his. People who know how are not afraid to pick up crabs in their bare hands. But if you do not know how, you should not try it unless you are willing to take a chance on being very painfully pinched.

And so the fun has begun. Before long the crabs are biting fairly often, but not every one that bites is caught. Excited hands pull in the lines too quickly or fail to lift the net at the right spot. So several crabs have been lost before they could even be seen, and a number have been lifted partly out of the water only to scramble like lightning over the rim of the net before they could be landed. In the meantime, the crabs

in the basket have been blowing bubbles of rage and snapping at each other because they have had nothing else to snap at. Presently the basket is so full that the stronger crabs are climbing up on the backs of the others and threatening to crawl over the edge and escape. Besides, it is getting late.

And now that we have our crabs, what shall we do with them? This is just as simple as catching them. We may cook them in the back yard or on the beach; either place is lots of fun. All we need is a large pot with a cover and a fire. We heat a quart or two of water until it boils. Then into the pot we put the crabs, still snapping and blowing bubbles. The cover is put in place and the crabs are steamed until they are thoroughly cooked, which takes about half an hour.

Do I hear someone object that this method of cooking crabs is cruel? Well, fortunately for us, it is not cruel, because the crab does not feel pain in the sense that most animals do. If we had to wait until our shellfish were dead before cooking them, they would not be good to eat.

When the crabs are done, we find that a surprising change has taken place since they were put into the pot. They went in a dark green, and they have come out a bright red. But that is only on the outside. When we pull off the hard top shell, we find that the flesh is a beautiful and tempting white, and it tastes as good as it looks. But in eating your first crab, you must be careful to watch someone with more experience who is eating his. Certain parts of the crab—fingerlike

parts that lie on each side, right under the shell—are not good to eat and are thrown away. Next comes a thin, hornlike shell, and under that the "flakes," which cost so much in our markets. They are thought to be —as they are—among our most delicious foods.

You will not need knives and forks to eat your crabs from the shell, and you had better roll up your sleeves and wear your old clothes. Steamed crabs from the shell are not the sort of thing we serve at the dinner table, but belong to the picnic dishes. But crabs served in any other way are never so delicious, and the fun of cooking them makes a perfect ending for the sport of catching them.

Frank McLean

Can You Find Steps and Arrange Them in Order?

Write the heading *How to Catch Crabs* on your paper. Below it list all the important steps in catching crabs that you found in this lesson. List them in order. Not everyone in the class will have the same number of steps, because some of you will group the steps and some will list every one of them separately. But each of you should have at least six important steps, and they should be in the right order.

Now write the heading *How to Cook Crabs* on your paper. Below it list, in order, the important steps in cooking crabs.

Can You Find the Right Meaning?

Many of the words in the English language have several meanings. In order to understand what you read, you need to know which meaning the author had in mind.

Below are 12 sentences taken from lessons you have read in this reader. On pages 199 and 200 are two definitions for each of the underlined words. Number your paper from 1 to 12. Read the first sentence. Look at the definitions for the underlined word. Which of the definitions best fits into the sentence? Write the letter that is before that definition after number 1. Do the same for the rest of the words. *Do not write in this book.*

SENTENCES

1. In the first place, the men go about and tap the trees, drive in the spouts, and hang the buckets under them.

2. Little Gudrid scampered back up the ladder to her bed in the loft.

3. Trading ships from Europe came there bringing meal, lumber, tools, and cloth to exchange for other goods.

4. Still the wagon wheels moved heavily and the oxen strained at their yokes.

5. One family made a battering-ram of a log to bump the trunks of the trees hard enough to jar the nuts down.

6. Fires caused by man can be prevented by constant care with matches, cigarettes, and campfires.

7. The stiff breeze from the east puffed out the sail again and sped the young traders to the safe harbor of Erne Pillar.

8. If you can't get water stir in dirt and tread it down until packed tight over and around the fire.

9. Never burn slash or brush in windy weather or while there is the slightest danger that the fire will spread.

10. We set out from home, carrying nothing except a net with a long handle, a ball of strong wrapping twine, a few odds and ends of old iron or lead to use as sinkers, and a bag or basket to bring home our catch.

11. The crabs like to gather in the shadows under the docks and to cling to the piles.

12. For a little while nothing happens, except that the current swings the line around.

DEFINITIONS

1. tap
   a. knock or rap lightly
   b. to pierce, open, or break into

2. loft
   a. attic or upper room of a house
   b. upper part of a barn

3. meal
   a. food prepared for eating
   b. ground grain

4. strained
   a. pressed or pushed through
   b. pulled with all their might

5. log
   a. a heavy piece of unshaped timber
   b. a daily record of a ship's progress

6. constant
   a. firm or faithful
   b. never-ending

7. stiff
   a. strong and powerful
   b. not easily bent

8. tread
   a. to walk on or over
   b. to beat down with the feet

9. slash
   a. a long cut or slit
   b. waste from cut, burned, or broken trees

10. catch
    a. that which has been captured or taken
    b. to overtake

11. piles
    a. a great many things heaped together
    b. stakes driven into the ground to support a foundation

12. current
    a. a body of water moving in a certain direction
    b. a movement of electricity

Using an Index from a Geography

On page 202 is a part of an index taken from a geography that is used by fifth-grade boys and girls. It is copied exactly as it is given in the book, but because the pages of this reader are not so large as those of the geography from which the index is taken, only part of the page can be shown here.

The following questions can be answered from the sample index page. The answer to each question is a number. Letter your paper from *a* to *v*. Read the first question. Study the index to find the answer to that question. After the letter *a*, write the number that answers the first question. Answer the other questions in the same way.

Before you start to work, be sure to read the note below the index. *Do not write in this book.*

a. In which column do you find pages that tell about manufacturing?

b. In which column do you find pages that tell about mining in Alaska?

c. In which column is there a cross reference?

d. In which column is the pronunciation of *Manitoba* shown?

e. To what page should you turn to find a definition of manufacturing?

f. How many pages tell something about marble?

g. On what page is there a map that shows the Maritime Provinces?

Manila (mȧ-nĭl′ȧ), 211, 212 (*210*, C5)
Manila hemp, 211, 212
Manitoba (măn-ĭ-tō′bȧ), 226, 227 (*220*)
manufacturing
definition of, 20
in Canada, 222, 223–224, 225, 227, 228
in Central States, 122, 123–124, 131, 133, 134, 135, 136, 137, 138, 141, 142, 146, 147–148, 150, 153
in Mexico, 238
in Middle Atlantic States, 44–45, 47–53, 60, 63–65, 69–71, 74–75
in New England, 20–27, 32, 38, 39
in South America, 265, 266, 282, 286–287, 297, 298
in Southern States, 80, 90, 92, 94, 95–97, 98, 99, 100, 104, 105, 108, 110
in Western States, 162, 171, 175, 177, 183, 186, 190, 193–194
maple sugar, 33
Maracaibo (mä-rä-kī′bō), 272 (*276*, B2)
Maracaibo, Lake, 270, 271, 272 (*276*, B3)
Marañon River (mä-rä-nyōn′), 259 (*257*, B3)
marble, 33, 98
Maritime Provinces (măr′ĭ-tĭm), 219–222 (*221*)
market gardening, 29, 56, 145, 188, 286
Maryland (mĕr′ĭ-lȧnd), 51, 54, 57, 66 (*49*, *52*)
Massachusetts (măs-ȧ-chōō′-sĕts), 17, 20, 22, 23, 30, 32, 35, 37 (*21*, *24*)
Mexican Plateau, 173, 179, 180, 235, **236–238** (*251*)
Mexico (mĕk′sĭ-kō), **234–243**, 253, 254, 258, 260 (*240*)
Mexico (city), 238 (*240*, E4)
Miami, Fla. (mī-ăm′ĭ), 102, 248, 309 (*85*, G7)
Michigan (mĭsh′ĭ-gȧn), 69, 142, 145, 146, 149, 151 (*117*, *120*)
Michigan, Lake, 138, 139, 140, 142, 144, 145, 148, 149, 150 (*11*, J2)
Middle Atlantic States, 41–77 (*49*, *52*)
Milwaukee, Wis. (mĭl-wô′kē), 148 (*117*, D3)
mining
in Alaska, 204, 206
in Bolivia, 279
in Brazil, 264
in Canada, 222, 225, 227, 229, 231
in Central America, 245
in Central States, 124, 130, 135, 149, 150–151
in Chile, 284, 285, 287
in Colombia, 271
in Cuba, 248
in Guianas, 268
in Mexico, 237
in Middle Atlantic States, 64–65, 67–68, 69, 70–71
in Newfoundland, 233
open-pit, 151
placer, 187, 206, 271, 272
in Peru, 275
in Southern States, 97, 101, 103, 107
in Western States, 162, 163, 166, 177, 178, 179, 180, 187
See also names of minerals

Map references are given thus: *161*, F4. The number in italic type, *161* = the map page; F4 = the letter and number on the margins of the map.

h. On what page should you expect to find information about open-pit mining?

i. On what page does the longest reference on manufacturing in the Middle Atlantic States begin?

j. On how many pages is there information about mining in Canada?

k. To what page should you turn to find something about maple sugar?

l. What page might give the answer to the question "How important is manufacturing in Mexico?"

m. How many maps are there of the Middle Atlantic States?

n. On how many pages is there some information about mining in the Western States?

o. What number on the margin of the map will help you locate Miami?

p. Which syllable in Massachusetts is accented?

q. On how many pages are there maps showing the state of Maryland?

r. How many references are there to placer mining?

s. What number on the margin of the map will help you locate Manila?

t. What page might give the answer to the question "What minerals are found in Bolivia?"

u. On what page should you look to prove that Mexico City is not near the seacoast?

v. On what page is there a map of Lake Michigan?

Learning to Think about What You Read

Very often you can read a single paragraph rather quickly, but unless you think about it for a much longer time, you will not really understand all that it means. This lesson contains just one paragraph. The exercises will help you to think about it.

One day in June a man who was flying near a city had so much trouble with the engine of his airplane that he was forced to land quickly. The airplane came down in a large garden owned by Mr. Swan, who made his living by selling flowers and vegetables. The pilot was uninjured, but his plane was badly damaged. Before it stopped, it tore down many rosebushes and dug up big patches of valuable flowers and vegetables. A large crowd of people, eager to see the aviator and his wrecked plane, rushed into Mr. Swan's garden and ruined almost everything that had not already been destroyed by the plane.

How Well Do You Understand a Paragraph?

Decide for each of the following questions whether it should be answered *Yes* or *No*, and read the part of the paragraph that you think proves your answer.

1. Could the pilot help landing in the garden?
2. Was the pilot killed?
3. Could the pilot immediately have flown the airplane out of the garden?
4. Did the airplane injure the garden very much?
5. Did the people who came to see the airplane do any damage to Mr. Swan's garden?

How Well Do You Think about a Paragraph?

1. Who was to blame for the damage done to Mr. Swan's garden? Decide which answer you think is best. Why?

   a. Mr. Swan himself
   b. The pilot of the airplane
   c. The crowd who came to see the wrecked plane
   d. Both the pilot and the crowd
   e. The police, for not coming quickly enough to keep the crowd away

2. What should Mr. Swan have done when the airplane came down in his garden? Decide which of the answers you think are right. You may think that more than one answer is right. Give the reasons for your choices.

   a. He should have called the police to keep people out of his garden.

b. He should have charged each person fifty cents who wanted to see the airplane.

c. He should have forgotten about his garden and helped the pilot.

d. He should have kept the airplane until he was paid for the damage to his garden.

e. He should have helped the pilot, but should have told him that he would have to pay for damage to the garden.

f. He should have asked the police to arrest the pilot for damaging his garden.

3. What should the pilot have done because of the damage to Mr. Swan's garden? Choose the best answer, and be able to give a good reason for your choice.

a. He should have done nothing at all except to fix his plane and take it away.

b. He should have paid Mr. Swan for the damage done by the plane but not that done by the crowd.

c. He should have paid Mr. Swan for all the damage done to the garden.

d. He should have told Mr. Swan that he was sorry, but should not have paid anything for the damage done.

4. What should the crowd have done who came to see the airplane?

a. They should have kept out of Mr. Swan's garden unless they had his permission to go in.

b. Since they did go in and damage the garden, they should have taken up a collection to pay for all the damage that they did.

c. They should have told Mr. Swan that they were sorry for tramping down his garden, but they should have paid him nothing.

d. They should have taken pieces of the airplane home with them for souvenirs.

5. The following statements are useful not only in thinking about this accident, but also in discussing other accidents like it. Decide whether you think each statement is true or false. Be able to give a reason for deciding as you did.

a. Since it is important to encourage aviation, the pilot of an airplane should be excused from paying for any damage done when his plane falls to earth.

b. A gardener has just as much right to collect money from a pilot who lands in his garden as from a farmer whose cattle get in and destroy his crops.

c. Any man who flies an airplane should know that he may be forced to land and should be willing to pay for any damage that he may cause.

d. Anyone who causes damage by walking through a man's garden should be made to pay for the damage done.

e. In such accidents as this, gardeners or farmers should say that it is simply hard luck and expect no one to pay for the damages done.

Outlining a lesson after you have finished reading it will help you to remember the important points. The first part of this lesson has been outlined for you. After each of the other parts there will be an outline to fill in. When you have finished the entire lesson, you will have an outline covering all the important points.

As you read, watch for the main points and subpoints to fill in each outline.

I. BANANAS AN IMPORTANT FOOD

Sixty years ago bananas were so high priced that few people could afford to buy them. One banana might cost as much as ten cents. Times have changed! Today, because they cost very little and because we all like them so much, bananas have become a common food, although they are shipped to us from warm countries hundreds of miles away.

For a long time nobody thought of cooking bananas. They were always eaten raw, as most of them still are. But we have learned that they are also excellent when cooked. So today they may appear at our dinner tables baked, or broiled, or fried.

Unless bananas are fully ripe, they should not be eaten uncooked. Bananas are ripe only when their skins are yellow all over—*yellow-ripe*, as they are called in the market—or when the skins are spotted with brown. Some people throw away bananas that

have brown spots on the skin, because they think them spoiled. Such bananas are more easily digested than those that are yellow-ripe, and many people like their taste better. People who know tell us that a banana with a green tip should not be eaten without cooking, even though the rest of the skin is yellow.

In countries where bananas are grown, they are often the chief food of the people. They take the place of other starchy foods, such as potatoes and cereals. Natives make flour out of them by peeling, drying, and grinding the unripe bananas. This flour they make into a kind of porridge by cooking it in water or milk. Then they eat it with cream or lemon juice and powdered sugar. They also make a delicious sweetmeat known as "banana figs." They peel ripe bananas, sprinkle them with sugar, and put them out to dry in the sun. Why not try to make banana figs yourself?

Can You Match Paragraphs and Subheadings?

The main heading and two subheadings for the part of the lesson you have just read are given below. They are given in outline form. Notice that both subheadings tell about the main heading.

I. How important bananas are as a food
   A. Bananas as a food in this country
   B. Bananas as a food in countries where they are grown

Find the paragraphs that tell about each of the subheadings.

II. HOW BANANAS GROW

A bunch of bananas is so big that you might think that it could grow only on a tree. But bananas really grow on plants, one bunch to each plant. To be sure, the plant is a big one. It grows from fifteen to twenty-five feet high.

The part that looks like the trunk of a tree is not a trunk at all, although it is sometimes a foot or more through near the ground. It is really a huge stalk made of the bottom parts of the leaves wrapped around a soft center. At the top the leaves spread out from the stalk eight or ten feet, making the plant look somewhat like a palm tree.

At the end of the tenth or eleventh month after the plant has begun to grow, a flower bud appears, push-

ing up through the center of the leaves at the top of the stalk. The heavy purplish-red bud, or blossom, is from six to nine inches long. As the flower bud grows, its stem bends over and downward, looking very much like a large ear of corn covered with its husk.

The bananas form on this stem, directly back of the blossom. When the leaves of the flower bud drop off, the tiny bananas, pointing downward, can be seen. But as they grow, they bend upward. So the bunches hanging in grocery stores are hung upside down!

Bananas grow on the stem in clusters, which the growers call *hands*. Look at a bunch, if you can find one hanging in a store, and you will see the hands. Bunches are graded for selling according to the number of hands on them. One with eight hands is called an *eight*, with nine hands or more a *nine*. Once in a great while a bunch will have as many as twenty-two hands.

To you a banana is always a banana, but to people who buy and sell bananas, it is also a *finger*. Shouldn't you expect a *hand* to have *fingers*? In the markets the bunches will be graded not only by the number of *hands* to a bunch, but by the number of *fingers* (bananas) to a *hand*, or cluster. There must be at least ten *fingers* to a *hand*, if the bunch is to be considered of good grade. Usually there are about sixteen. Often there are two hundred or more bananas in a bunch, and in a very large bunch with more than the usual six to nine hands there may be as many as three hundred.

Can You Put Subtopics under the Right Subheadings?

The main heading and three subheadings for Part II are given below. They are arranged in outline form. The outline is also numbered for subtopics. Remember that subtopics tell about subheadings and are indented under them. Subtopics should be placed in the outline in the order in which they come in the lesson.

The outline for this part of the lesson has seven subtopics. Three of them tell about *A*, the parts of the plant, two of them tell about *B*, how the fruit develops, and two of them tell about *C*, the parts of the bunch. Copy the outline on your paper and then fill in the subtopics in correct order. *Do not write in this book.*

II. How bananas grow
- *A*. The parts of the plant
  1. ___?___
  2. ___?___
  3. ___?___
- *B*. How the fruit develops
  1. ___?___
  2. ___?___
- *C*. The parts of the bunch
  1. ___?___
  2. ___?___

III. WHERE BANANAS ARE GROWN

Bananas are a tropical fruit and cannot be grown in a temperate or a cool climate. Because they need plenty of heat and rainfall, bananas grow best in parts

of Africa, Asia, Australia, Central America, the West Indies, and South America.

The greatest banana plantations in the world are along the Atlantic coast of Central America, in the West Indies, and in northern South America. Here there are hot days, damp nights, and a yearly rainfall of eighty to two hundred inches. Several countries in this part of the world make a business of raising bananas and shipping them to other lands. From these countries comes most of our own supply.

Can You Find Subtopics?

The main heading and two subheadings are given for the two paragraphs you have just read. Copy the outline on your paper and then fill in the subtopics. *Do not write in this book.*

III. Where bananas are grown
   A. Where temperature and rainfall are good for growing bananas
      1. ___?___
      2. ___?___
      3. ___?___
      4. ___?___
      5. ___?___
      6. ___?___
   B. Where banana raising is a business
      1. ___?___
      2. ___?___
      3. ___?___

IV. ON A BANANA PLANTATION

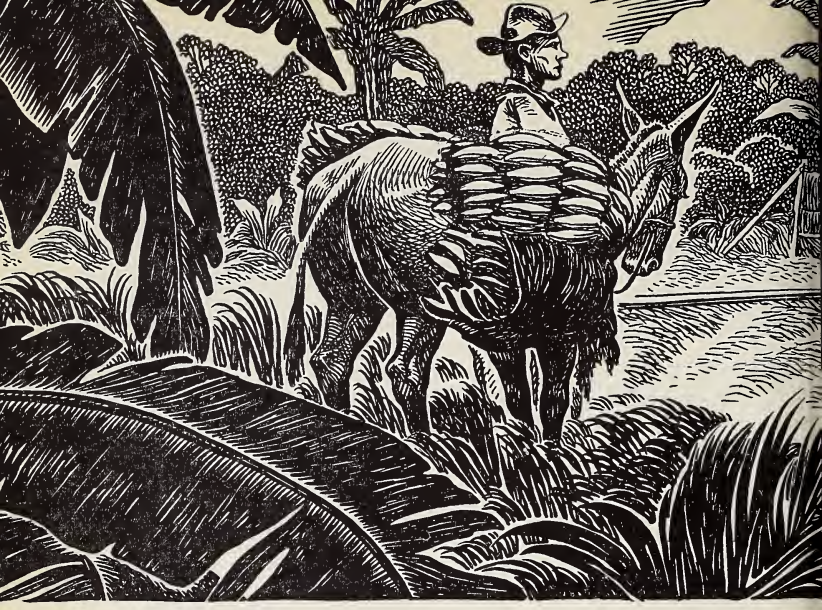
To turn a tropical jungle into a banana plantation requires much planning, skill, and hard work. Three things must be considered when a location is being chosen: the climate, the soil, and the amount of rainfall. Then it is wise to find out, too, about other conditions. Is this a region where there are frequent floods? And are there many hurricanes?

After a good location is found, the plantation must be divided up into sections called "banana farms." Plans for draining the plantation must be made. Buildings must be put up. Ways of shipping the fruit must be considered, for bananas are raised for sale at faraway markets. The grower may have to build wharves and bridges, and even sections of railroad, to connect with the main lines. He must have telephone connections too, so that messages can be sent and received quickly.

The banana grower has started with a jungle, or at least with land that is heavily overgrown with tropical plants, vines, and trees. All this thick growth must be cleared away, or, as the planters say, the land must be "underbrushed." Only the large trees are left standing.

As soon as the underbrush is cleared away, planting is started. Stakes are driven into the ground where the plants are to be grown. At each stake pieces of the root, or rootstalk, are planted. These pieces are called "bits." From them will grow the plants.

Next, the large trees that have been left standing are cut down, though they need not be taken away. These trees may lie on the ground wherever they fall, for this is a warm, rainy, tropical country, where the smaller branches and twigs will decay soon, and even the larger branches and trunks will be completely rotted away within two or three years. So the planter is saved the labor of removing trees.



But everything grows fast in the tropics. When the rootstalks have been in the ground for three months, the farm is ready for its first *cleaning*. Then weeds that might choke the baby plants are cleared away, and the workmen chop off, too, some of the limbs and branches of the big trees that have already been cut, so as to give the plants room to grow. Such a cleaning must be repeated every three or four months, and each time there will be a heavy new growth to clear away.

While they are cleaning, the workmen find that some *bits* did not grow beside the stakes where they were planted, and that some of the young plants have been damaged. They then do some replanting. These

small banana plants which they set out take root quickly and soon will be sending out new leaves.

In twelve or fifteen months the bunches of bananas, although still green, are ready for cutting. They are not left to ripen on the plant, because the fruit would lose its flavor, the skins would burst open, and insects would get inside.

Cutting is done when orders come from the office of a fruit company. They send word that a banana ship will be in port on a certain day. As soon as that news comes, everything is made ready so that the cutting can start at daylight.

Three men usually make up a cutting gang: a *cutter*, a *backer*, and a *muleman*. The cutter carries a long pole with a knife fastened on one end of it. He makes a little cut in the stalk of the plant a few feet below the bunch of bananas, so that the stalk will bend downward and bring the bunch within easy reach. But it must not crash to the ground. The cutter uses his pole to support the bunch of bananas and keep it from falling. Meanwhile the *backer* has stepped into

position. He is under the bunch as it is slowly lowered toward him until it rests on his shoulder. When it is safely in place the *cutter* cuts the bunch from the stalk, and trims off the flower bud that is still on the end of the stem. The *backer* carries the bunch of bananas on his shoulder and back to a near-by loading station.

When bananas are being cut near the railway, the *backer* may take his bunch to the track and put it on the tramcar. But more often the fruit is carried a short distance and then packed on a mule. The *muleman* takes the pack animals to the railroad where the fruit is loaded on the cars.

Special trains of empty banana cars, each with its inspector and a gang of men to do the loading, are sent out into the plantations as soon as the cutting is well under way. The train picks up the fruit all along the route and carries it to the port where it is loaded on the ship.

As the bunches of bananas are moved from the cars to the loading machine which carries them into the hold of the ship, each one is carefully inspected again. Any bunch that is damaged is put aside; any that shows the least bit of yellow color is kept back, as well as all that have bananas that are underdeveloped or overdeveloped. Hour by hour the loading goes on, by night as well as day, with never a stop, until all the trains have rolled in with their loads and all the fruit has been taken off. Bananas must be handled fast and shipped north quickly.

Can You Find Subheadings?

There are eleven subheadings under Roman numeral IV. There is one paragraph about each subheading except the one opposite *H*. There are three paragraphs about it. Copy the outline on your paper and fill in the subheadings. The first one is filled in for you. *Do not write in this book.*

IV. A banana plantation
- *A*. Choosing a location
- *B*. ___?___
- *C*. ___?___
- *D*. ___?___
- *E*. ___?___
- *F*. ___?___
- *G*. ___?___
- *H*. ___?___
- *I*. ___?___
- *J*. ___?___
- *K*. ___?___

V. CARRYING BANANAS TO MARKET

If the fruit is to reach its journey's end in good condition, it must be kept under the right temperature and moisture on the way. A special kind of refrigerator ship is needed, because good refrigeration for bananas means more than a low temperature. Cool, fresh air must always be circulating through the hold, which is the part of the ship where the bananas are stored.

It takes a ship from three to five days to go from the Central American ports to the southern ports of the United States, and five to seven days to ports farther north. An extra day is needed for boats that go to Montreal. The voyage to British and other European ports may take from fourteen to sixteen days.

The ports in the United States that lead in importing bananas are New Orleans, New York, Philadelphia, Baltimore, and Boston.

At the end of their journey by water, the bananas are unloaded on special docks by special machinery. Here they are inspected once more before they are packed in refrigerator cars to be shipped to all parts of the country.

There is still much to be done to get bananas from the docks to the people who buy them for food. First, fast trains move these cars as rapidly as possible to their destinations.

Second, the wholesale dealer takes the bananas from these refrigerator cars to the wholesale house. When he takes the bananas from the refrigerator cars, the bananas are still green. He puts them into specially built rooms where they will ripen, under the right temperature, in from three to ten days.

Third, when the bananas are ripened, the wholesale dealer sells them to the groceryman, who may buy whole bunches packed in crates or a certain number of clusters packed in a box. Bananas were formerly

sold almost wholly in bunches. Now they are being sold more and more in clusters.

Fourth, the groceryman sells them to his customers. The wonder is that we can buy these bananas from the groceryman for so low a price when they have come so far and have been handled by so many people.

Can You Make an Outline of Part V?

Copy the following skeleton outline:

V. Carrying bananas to market
- *A.* ___?___
- *B.* ___?___
- *C.* ___?___
- *D.* ___?___
- *E.* Bringing bananas from the docks to people's homes
  1. ___?___
  2. ___?___
  3. ___?___
  4. ___?___

Read the first paragraph. What does it tell? Does it tell anything about carrying bananas to market? Write the topic of this paragraph as a subheading opposite *A*. *Do not write in this book.*

Now write the subheadings after *B*, *C*, and *D*.

Notice that there are four steps in bringing the bananas from the docks to people's homes. Write these steps as subtopics 1, 2, 3, 4, under *E*.

The Pony Express

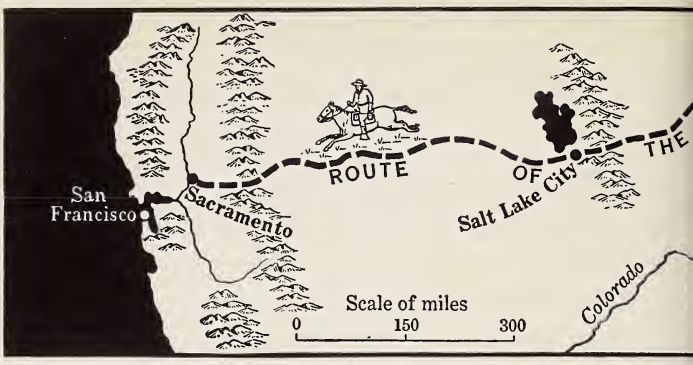
I. AN EXCITING ADVERTISEMENT

Late in the month of March, 1860, thousands of people in all parts of the country were talking about an advertisement that had just appeared in both a New York and a St. Louis newspaper. They read the advertisement, looked at the pictures of riders on racing ponies, and decided that the age of speed had arrived. The advertisement began:

TO SAN FRANCISCO IN EIGHT DAYS
BY
THE CENTRAL OVERLAND CALIFORNIA
AND
PIKE'S PEAK EXPRESS COMPANY.

This advertisement was the first news the people had of the famous Pony Express that was soon to carry mail from St. Joseph, Missouri, to Sacramento, California. In 1860 such service meant a saving of at least two weeks in the coast-to-coast delivery of mail. But few people at that time thought such speed could be made in crossing the plains, the mountains, and the deserts of the West.

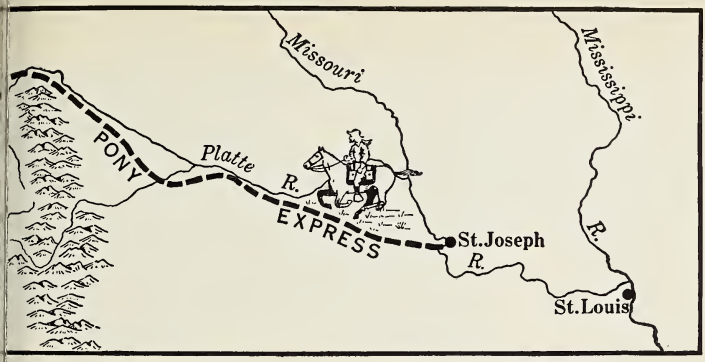
At the present time, when air mail can be delivered to any city in the United States or Canada within a day or two, it is difficult to understand what such a promise meant to the people of 1860. There were a few telegraph lines and railroads east of the Missouri River



at that time, but in the two thousand miles of thinly settled land between the Missouri River and the Pacific Ocean there was not a single telegraph line or railroad. Telephones had not been heard of in those days.

Thousands of people had gone to California and were cut off from the East by plains, deserts, and mountains. They wanted letters from home and news of the world without waiting weeks and weeks for mail to be brought by boat, or by stagecoach across the desert and over mountain trails.

Soon after the route of the Pony Express from St. Joseph to Sacramento was decided upon, express riders were carrying mail to California. Only letters, telegraph messages, and other first-class mail were carried by Pony Express. Mail had to be written on the thinnest paper to lighten the loads for the ponies. Letters were rolled, wrapped in oilskin, and sealed. They were about the size and shape of a pencil.



At first it cost five dollars to send each half ounce of mail by Pony Express. In a short time, however, the price was reduced to one dollar. Today we pay only three cents to send a whole ounce of mail from New York to San Francisco by regular mail, and only six cents by air mail.

Stopping places, called stations, were built every ten or twelve miles along the way. Here the riders changed ponies. Each rider rode seventy-five to one hundred miles a day, which meant that he had to change ponies at least seven times. At the end of his run, the rider rested a while and then rode back with the return mail. Going west, the rider carried westbound mail, and going east he carried eastbound mail.

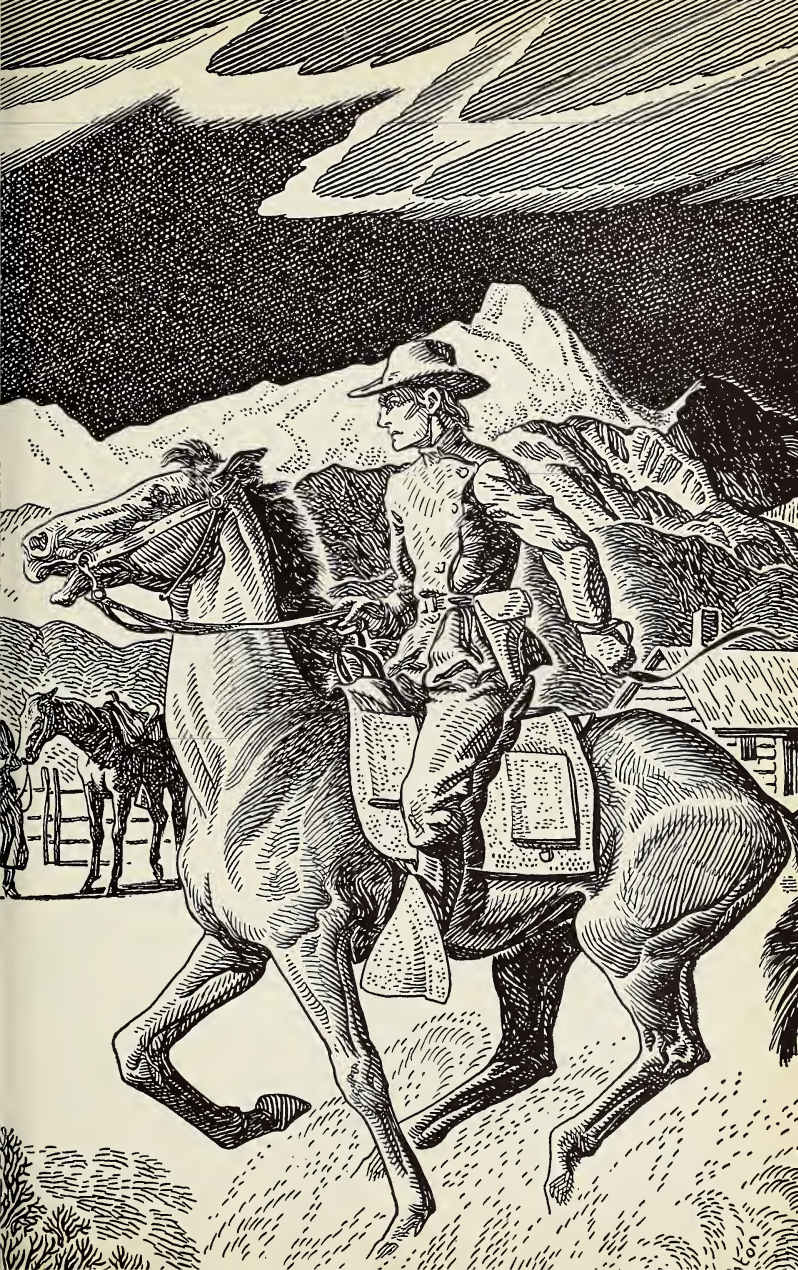
To travel swiftly, the ponies had to carry light loads. Most of the riders weighed less than one hundred and twenty-five pounds. Special lightweight saddles were used. The mail was carried in four boxlike leather

containers called cantinas (kän tē′näz). The cantinas were padlocked, and only station agents had keys. The cantinas were fastened to a large piece of leather, called a mochila (mō chē′lä), which fitted snugly over the saddle. The rider sat on the mochila, so that it could not be lost.

Only two minutes were allowed to change ponies at each station along the route. When a rider dashed up to a station, he leaped from his sweating pony, grabbed the precious mochila from the saddle, threw it across the saddle of the fresh pony, and, swinging himself into the saddle, disappeared as quickly as he had come.

The owners of the Pony Express hired eighty riders. The company owned five hundred of the best ponies it could buy, and one hundred ninety stations. The distance traveled was nearly two thousand miles. Mail was usually carried about two hundred miles a day by Pony Express, but on special occasions it was carried much farther. At first, mail was carried from east to west, and from west to east, once a week. Soon, however, mail went each way twice a week.

The young men who were chosen for Pony Express riders had to be light, wiry, and strong. They also had to be brave and know how to keep cool and to think fast in the face of great danger. When snow and ice lay deep in the mountain passes, or when flood waters spread across the plains, they had to be able to follow the old trails or to make new ones. When they met



wild, unfriendly Indians, they had to shoot straight or be able to outrun them. Indians were not the only people whom the riders had to fear. Bands of robbers sometimes lay in hiding along the route, ready to rob the riders, or even to kill them.

In some places the Pony Express riders had to ride through bushes so high that they could not see far down the trail ahead of them. In summer and winter, through snow and sleet and rain, the riders went. Over hot sands they galloped, and through raging, flooding rivers they plunged their tough ponies. Sometimes, when a pony could go no farther, the rider lifted the mochila from the saddle and hurried on foot to the next station.

Sometimes, when a rider reached a station, he would find it completely destroyed. Indians or robbers had killed the station agent and had stolen the ponies. If it were the last station on his run, the rider would have to carry the mail on until he reached the next rider. Stories are told, too, of ponies whose riders were shot down by Indians, but which galloped on and arrived riderless at the next station.

One rider named Kelly tells about a Mexican rider who came dashing into a station with a bullet hole through his body. He had been shot by Indians, but he brought the mail through. Although the men at the station gave him the best care possible, he died. Then Kelly himself had to ride back with the return mail, through the very forest where the Mexican had been shot. The road through this forest was so narrow that there was just room for a horse and rider. The trail was crooked, and the branches of trees made it impossible for Kelly to see very far ahead of him. He expected trouble, so he had his pistol ready. He spurred his pony, dashing through the forest at a breakneck gallop. At the top of a hill he stopped to rest. All at once he saw some bushes moving. He knew that Indians were in hiding there. He shot several times into the bushes, and the bushes stopped moving. He rode on as fast as his pony could carry him.

Buffalo Bill was one of the most fearless riders. He was still a boy in his teens when the Pony Express was started, but he won fame for his daring.

How Much Do You Remember from a Single Reading?

When you have finished reading a lesson through once, you cannot expect to remember everything about it. Some parts you may not even have understood. The following questions will show you which parts of this lesson you remembered and which parts need more study. Read each question. Try to answer it. Then read again the part of the lesson that answers that question. Was your answer correct?

1. When was the Pony Express first started?
2. Why was the Pony Express started?
3. What route did the Pony Express follow?
4. What were the stations?
5. What was done to make sure that the ponies would not have heavy loads to carry?
6. What kind of men were chosen to be riders?
7. What did riders do when ponies tired out and could go no farther?
8. What did riders do when they found stations destroyed?
9. What dangers did the riders have to face?

II. THE FIRST PONY EXPRESS GOES THROUGH

On the afternoon of April 3, 1860, crowds of people thronged the streets of the little Missouri city of St. Joseph. Everyone was greatly excited, for it was the day on which the first pony was to leave St. Joseph with mail for California. Speeches were made, a fa-

mous brass band played, and crowds of impatient people eagerly waited for the train, which was due at five o'clock.

The crowds became even more impatient when they learned that the train was likely to be late. Such a delay would mean that the Pony Express could not leave at five o'clock, because the train was bringing letters from New York that were to be speeded on their way to California in the first mail.

In front of the Pony Express office, a small, wiry, young man led a pony up and down the street. He wore the uniform of the Pony Express riders—a red shirt, blue trousers, and fancy boots. Finally he had to lead his pony back to the stables, because people in the crowd were pulling the hairs out of her tail and mane to make into watch chains and rings to keep for souvenirs.

As the anxious crowds waited in St. Joseph, the first mail train rushed across Missouri. The engineer was trying to make up time, so that the mail would be no later than necessary. The engine burned wood and had to stop along the route to get fuel. Fuel agents along the line were prepared to load wood onto the train as soon as it pulled into their stations. One fuel agent had built a special loading platform, and here the train was stopped only fifteen seconds to take on wood. Passengers on the train held to their seats and scarcely breathed as the daring engineer sped the rocking little train across the state.

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When the train whistled and pulled into the St. Joseph station, cheers arose for the engineer who had broken all records on this run. He was the hero of the hour. He had made the run across Missouri, a distance of 206 miles, in four hours and fifty-one minutes. The mail, which had left New York on Saturday, was only two and a quarter hours late in arriving at St. Joseph on that well-known Tuesday.

Forty-nine letters, five telegrams, and several newspapers were hurriedly stuffed into the cantinas. The mayor of St. Joseph threw the mochila across the saddle, and horse and rider started off. A cannon in front of the city's finest hotel boomed a signal to the captain of the ferryboat to be ready to carry the horse and rider across the Missouri River. Loud cheers rang out from the crowd as the first Pony Express headed for California.

All along the way, watchers cheered the riders on their dangerous journey. Day and night the men rode. Just ten days after the first rider left St. Joseph, the last rider brought the mud-spattered mochila into Sacramento.

A cannon boomed a noisy welcome in Sacramento. Boys beat anvils placed on street corners. Guns were fired, shouts went up, and ladies' handkerchiefs fluttered in the breeze, as the pony galloped up to the Pony Express office.

At the same time that riders were speeding the westbound mail over the trail toward California, other

riders were bringing another mochila eastward. Just eleven and a half days after the first rider left Sacramento, the last eastbound rider dashed into St. Joseph. The riders carrying the mail eastward had been delayed by a heavy snowfall in the Sierra Nevada Mountains.

As soon as the mail from California arrived in St. Joseph, the important news was telegraphed to the East. In this way messages could be sent from coast to coast in less than two weeks.

For nineteen months the daring riders of the Pony Express raced between Missouri and California. Then a telegraph line was built between St. Joseph and Sacramento, and the Pony Express was no longer necessary. The clattering hoofs of galloping ponies could not race against the clicking keys of the telegraph operator. The days of the Pony Express were over.

Today, over almost the same route traveled by the Pony Express, airplanes roar through the clouds and carry mail from the Atlantic to the Pacific in a single day. Important messages can be sent from coast to coast in a few minutes by telegraph. Telephone calls

can be made to almost any place in the United States. The Pony Express is a thing of the past. Even so, thrilling tales of the galloping ponies and their daring riders will always be remembered.

How Much Do You Remember?

Without turning back to the lesson, answer the following questions:

1. On what date did the first Pony Express start?
2. From what city did it start in the East?
3. How was the Pony Express rider dressed?
4. How was the mail from the East brought to St. Joseph?
5. How much mail was carried by the first rider?
6. How did the rider get across the Missouri River?
7. How long did it take to make the first Pony Express trip west?
8. What city was at the western end of the trip?
9. What delayed the first Pony Express riders carrying the mail eastward?
10. For how long a time were messages carried by Pony Express?
11. What replaced the Pony Express?
12. In what three ways can messages now be sent from coast to coast in a very short time?

If there was any question that you could not answer, find the part of the lesson that answers it. Study this part. Again try to answer the question.

Learning to Read a Road Map

One of the most interesting of all maps is a road map. Some road maps show roads for an entire country. Others show roads for only part of a country, such as a state of the United States or a province of Canada. Still other maps may show roads for only a small part of a state or a province. The map on page 240 shows that part of Ohio near Cleveland.

You have probably seen many road maps. You may have used one on an automobile trip. But did you know how to read it? Many people, grown-ups as well as boys and girls, do not know how to use a road map to find information.

Can You Read the Key of a Road Map?

In order to get as much information as possible from a road map, you must first know what the signs, or symbols, stand for. Below the map on page 240 is the key, or explanation, of the symbols that are used on the map. Study the key to answer the following questions:

1. How many kinds of roads are shown in the key?
2. What kind of road is represented by heavy solid lines?
3. How are dirt roads represented on this map?
4. Are numbers in circles used to mark United States highways or state highways?

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RAND McNALLY & CO. CHICAGO
Lake Erie
N
W
E
S
CLEVELAND
Fairport Harbor
Grand River
Mentor on the Lake
Mentor
Willoughby
Willowick
Wickliffe
Euclid
East Cleveland
Wilson Mills
Mayfield
Mulberry Corners
Fowlers Mill
Cleveland Hts.
Warrensville
Gates Mills
Orange
Chesterland
Newbury
Russell
Chagrin Falls
Bainbridge
Geauga Lake
Avon Lake
Rocky River
Lakewood
Lakebreeze
Lorain
Avon
Eagle Cliff
Vermilion
Oak Point
Sheffield
Amherst
Ridgeville
Dover Center
North Olmsted
Parma Heights
Shaker Heights
Maple Heights
Willowick
Independence
Bedford
Solon
Bainbridge
Axtel
Ceylon Jct
Brownhelm
Amherst
Elyria
Florence
Birmingham
Laporte
Olmsted Falls
Berea
Westview
Strongsville
Parma
Brecksville
Northfield
Aurora
Twinsburg
Wakeman
Kipton
Oberlin
Lagrange
Grafton
North Eaton
Columbia
Hillsdale
North Royalton
Hinckley
Valley City
Brunswick
Weymouth
West Richfield
Richfield
Everett
Bath
Bolzum
Cuyahoga Falls
Hudson
Darrow
Earlville
Stow
Clarksfield
Pittsfield
Belden
Erhart
Penfield
Litchfield
Lester
Remsons Corners
Ghent
Montrose
Fairlawn
Kent
Brimfield
Hartland Center
Brighton
Wellington
Mallet Cr.
Medina
Granger
Windfall
Coddinger
Copley
Rochester
Spencer
Risley
Lafayette
Chippewa Lake
Poe
Boneta
River Styx
Sharon Center
Western Star
Lodi
Pawnee
Homer
Wadsworth
Akron
Mogadore
Saint Joseph
New London
Hereford
Ruggles
Semple
Huntington
Chatham
Nova
Sullivan
West Salem
Friendsville
Creston
Burbank
Seville
Doylestown
Barberton
Johnson's Corners
Lake Emore
Uniontown
Mishler
Savannah
Albion
Aukerman
Rittman
Scale of miles
0 5 10 20 30
MAP EXPLANATION
Paved roads
Improved roads
Graded roads
Dirt roads
Roads under construction
Connecting roads
Airports
State forests
State parks
Points of interest
Population of cities and towns
0-1,000
1,000-5,000
5,000-10,000
10,000-50,000
50,000-100,000
100,000 & Over
U. S. Interstate highways
State highways
Mileage shown between stars

5. How many classes of cities, according to size, does the key show?

6. How are cities that have a population between 5000 and 10,000 shown?

7. How are cities that have a population between 50,000 and 100,000 shown?

8. About how many miles does an inch represent?

9. How are state parks represented?

10. Where is the key to directions on this map?

11. How are airports shown?

12. How are points of interest shown?

13. How can you tell the number of miles between two points?

Can You Use the Key to Read a Road Map?

Imagine that you are taking a trip through this part of Ohio. You are starting from the west. As you travel you are reading the road map on page 240. Find the places and answer the questions given below.

1. Find Vermilion on Lake Erie. About how large a city do you expect it to be?

2. Plan to go eastward to Lorain. Over what kind of road shall you travel?

3. Go eastward until you reach Rocky River. Over what United States highway shall you travel?

4. Notice how much space the city of Cleveland covers on the map. About how far shall you be able to drive along Lake Erie and still be in Cleveland? Use the scale of miles to help you in answering this question.

5. About how far from Lake Erie is the southern edge of the city? Use the scale of miles.

6. Plan to leave Cleveland on state highway number 14. In what direction shall you travel if you are going to Bedford?

7. How far shall you travel from Cleveland to Bedford?

8. Now go directly south on a paved highway to Northfield. What is the number of the highway on which you shall now travel?

9. What does the map tell you about the population of Northfield?

10. Find Akron on the map. Shall you drive north or south from Northfield to reach Akron?

11. Go on to Akron. Shall you pass near any points of interest before you reach Akron?

12. Is there an airport in Akron?

13. On your return trip go west from Akron to Ruggles. Over what United States highway shall you travel?

14. At Ruggles turn north onto highway number 60. Is number 60 a state highway or a United States highway?

15. What is the largest town between Ruggles and Vermilion?

16. How many miles is it from Birmingham to Vermilion?

17. What are the two largest cities through which you passed on your entire trip?

18. Did you travel over paved highways on your entire trip?

Weather Forecasts

I. VALUE OF WEATHER FORECASTS

Who are interested in weather reports? Why are these people interested? Where do they live? These are some of the questions that are answered in the following lesson.

Today millions of people in the United States read the weather reports in newspapers or listen to the weather reports over the radio. They plan their work and play by the daily weather report that is sent out by the United States Weather Bureau. This bureau forecasts weather. To forecast means to tell what to expect. Therefore, to forecast the weather means to tell what kind of weather to expect.

Many people do not know that much property and many lives are saved by weather forecasts. Forecasts of storms give people, either on land or on sea, time to find a safe place or to prepare for the storm. Ships that are in a harbor may stay there until the storm is over. Ships at sea can make certain preparations, so that they are better able to come through the storm without damage. Aviators usually do not take their planes up if they have received warnings of storms. Fishermen take in their nets and tie their boats more securely if they know a storm is coming.

Weather forecasts also help the railroad and truck companies, especially when they are shipping prod-

ucts that spoil easily, such as vegetables, fruit, and eggs. If a cold wave is forecast, or predicted, the cars may be heated. If a hot wave is predicted, the cars may be iced in order to save the products. The companies often speed up the shipment of the goods so that it reaches the end of the journey before the bad weather sets in. Or, if the storm is near, the trucks or cars are run into storehouses until the bad weather is over.

City people are interested in weather forecasts. When a cold wave is predicted, automobile owners put antifreeze liquids into the radiators of their cars. The men in charge of apartment houses and office buildings make plans to furnish more heat in their buildings. Coal dealers see if they have enough fuel for all customers. If they have only a small supply, they fill only part of each order so that everyone will get some fuel. Street-cleaning departments get their men and snowplows ready, so they can start clearing away snow as soon as it falls.

When a hot wave is predicted, many people plan to leave the city. Shopkeepers advertise hot-weather goods, such as fans and bathing suits. Public-health officers warn people how to protect themselves against sunstroke or overheating. Ice-cream companies increase the amount of ice cream they make. These are only a few of the things that happen in cities when changes in temperature are forecast. Can you add any more that you have noticed?

Ice companies watch weather reports very carefully. The amount of ice that people need depends upon the temperature. Ice factories do not make so much ice in cold weather as in warm weather. Then, too, companies that get their ice from a lake, pond, or river plan to cut the ice according to weather predictions. When a cold wave is predicted, the cutting is put off until the ice is frozen thicker. However, if warmer weather is expected, the cutting is done as soon as possible, so that the ice will not become slushy.

Warnings of frost have saved farmers and fruit-growers great sums of money. Fruits, tobacco, sugar, cranberries, and vegetables often can be saved by protection from cold weather.

If farmers are warned of a late spring frost, they may cover vegetables with paper, soil, or cloth. Fruitgrowers may warm the air in their orchards by lighting heaters, building fires, or by flooding the irrigation ditches. By these methods they may save the buds and flowers of their fruit trees from freezing.

If the farmer is warned of an early fall frost, he may speed up the picking of such crops as beans and grapes. Some crops may be harvested even if they have not entirely ripened, for in that way at least part of the crop can be saved.

Fruitgrowers are interested not only in reports of frost but also in reports of rainfall. Raisin-growers need to know when to expect rain, because raisins will be spoiled if they are rained on while drying. If the warnings of rain come soon enough, the grower can stack the trays of raisins and either cover them or move them into a building.

Farmers who raise grains such as wheat are interested in weather reports. After the farmers have once

started harvesting, they hope for clear weather. If rain is expected, they speed up the harvesting as much as possible.

Weather reports are of great help to aviators. Every hour weather information is broadcast for pilots who are in the air. If a pilot wants special weather information, he calls the airport by radio. If there is a storm ahead, the pilot may land and wait until the weather has cleared.

Many airports have scientists who study weather. They not only study weather conditions on the ground but also study weather conditions high up in the air. Each day an airplane is sent up at the airport to record weather conditions. Instruments that are fastened to the wings record weather conditions at different levels in the air. Four times a day balloons are sent up. By watching the balloons, the weatherman can tell the direction and speed of the wind.

Can You Match Parts of a Sentence?

Below are parts of sentences that, when matched correctly, tell of uses that are made of weather forecasts. Read the first parts of the sentences in Group A. Then read the second parts of the sentences in Group B. Number your paper from 1 to 10. Read number 1 in Group A again. What part of a sentence in Group B matches it? Write the letter of this part on your

paper after 1. Match the rest of the sentences in the same way. *Do not write in this book.*

GROUP A

1. Ships at sea, if warned of a storm,
2. Warnings of rain save the raisin-growers money because they
3. When a cold wave is predicted, railroad and truck companies
4. Most aviators, if they have received warnings of storms,
5. When a heat wave is predicted, shopkeepers
6. If a cold wave is predicted, ice companies
7. When snow is predicted, street-cleaning departments
8. Many times ships that have been warned of a coming storm
9. When a heat wave is predicted, public-health officers
10. Warnings of frost save the fruitgrowers money because they can

GROUP B

a. ___?___ advertise hot-weather goods.

b. ___?___ have the cars heated that carry products that spoil easily.

c. ___?___ do not leave port until the storm has passed.

d. ___?___ get ready to keep the streets clear.

e. ___?___ have time to stack and cover their trays of fruit.

f. ___?___ make certain preparations so that they will not be damaged too greatly.

g. ___?___ do not take their planes up.

h. ___?___ put off cutting ice until it is frozen thicker.

i. ___?___ light the heaters in their orchards.

j. ___?___ warn people not to get overheated.

II. READING A WEATHER MAP

Have you noticed weather maps in the daily newspaper or seen weather maps that are sent out by the United States government? Have you tried to read them? Do you know how they are used? This lesson will help you to read weather maps better.

Weather forecasting is a science. Scientists need to know exact facts about weather conditions all over the United States in order to tell what kind of weather to expect. They must know a great deal about storms. They must know certain facts about the ways storms travel. They must know about weather conditions even on the oceans in order to make a forecast for a short time ahead. They know which facts are important because men have been studying the weather for a long time.

The United States Weather Bureau gets its information about weather conditions from weather stations that are set up in all parts of the country. There are about three hundred of these stations, and in each

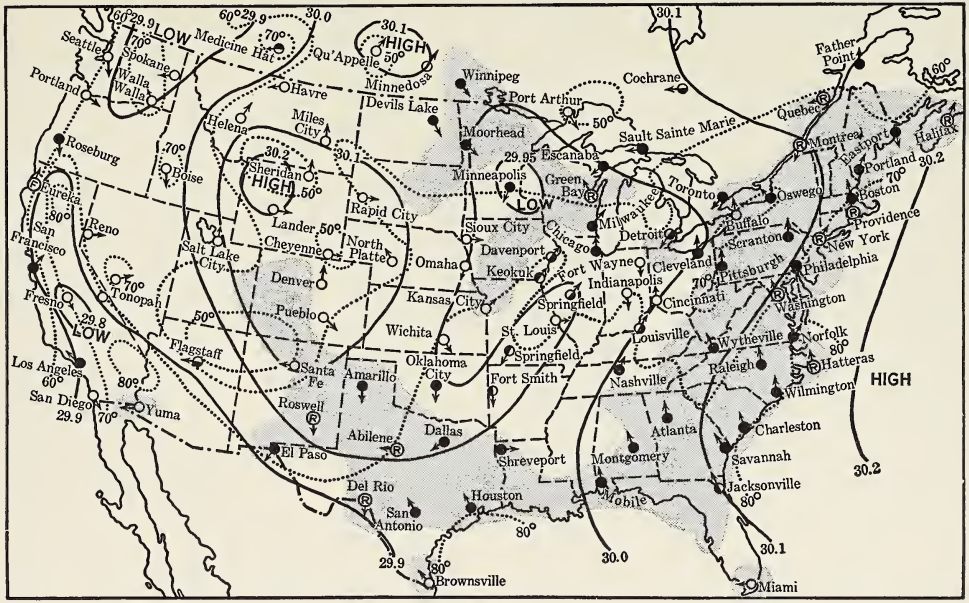
one of them a trained worker keeps records of the weather conditions. Weather stations have special instruments that record weather facts. Most of these instruments have been improved so that now they record the report. Even if the instruments are on the roof of the station, their recordings are written so that the weatherman can read them without going out of his office.

Twice a day each station telegraphs reports of weather conditions to certain larger weather stations and to the five forecast centers. The forecast centers are Washington, D. C., Chicago, Denver, San Francisco, and New Orleans. The report includes the following weather facts: (1) direction of the wind; (2) speed of the wind; (3) temperature at the time of the report; (4) the highest temperature in the past twenty-four hours; (5) the lowest temperature in the past twenty-four hours; (6) the amount of snow and rain in the past twenty-four hours; (7) the air pressure; and (8) whether or not it is fair, partly cloudy, very cloudy, rainy, or foggy at the time of the report.

The weather information that comes into the larger stations and the forecast centers is put on an outline map of the United States. These maps give the scientists information about the wind, temperature, air pressure, sunshine, and rainfall or snow in all parts of the United States. By studying the map, they can tell what kind of weather each part of the country may expect the next day. A new weather map is made each day.

A weather map is difficult to understand unless one knows the meaning of the signs or symbols that are used on it to give information. The map on page 253 shows some of these symbols. Every boy and girl can learn to read some weather facts from this map.

Each station that makes a report which is used on the map is located by a circle. Find a station near


LOW
Medicine Hat
Seattle
Spokane
Walla Walla
Portland
Roseburg
Eureka
San Francisco
Fresno
Los Angeles
San Diego
Yuma
Tonopah
Reno
Boise
Helena
Havre
Qu'Appelle
HIGH
Minnedosa
Devils Lake
Winnipeg
Port Arthur
Cochrane
Father Point
Quebec
Montreal
Eastport
Halifax
Portland
Boston
Providence
New York
Philadelphia
Washington
Norfolk
Hatteras
Wilmington
Charleston
Savannah
Jacksonville
Miami
Atlanta
Montgomery
Mobile
Moorhead
Sault Sainte Marie
Escanaba
Green Bay
Minneapolis
Toronto
Oswego
Buffalo
Scranton
Cleveland
Pittsburgh
Detroit
Milwaukee
Chicago
Sioux City
Rapid City
Miles City
Sheridan
Lander
Cheyenne
North Platte
Omaha
Davenport
Keokuk
Fort Wayne
Indianapolis
Cincinnati
Springfield
St. Louis
Louisville
Wytheville
Raleigh
Nashville
Fort Smith
Oklahoma City
Kansas City
Wichita
Pueblo
Denver
Salt Lake City
Flagstaff
Santa Fe
Amarillo
Roswell
Abilene
Dallas
El Paso
Shreveport
Houston
San Antonio
Del Rio
Brownsville
30.0
30.1
30.2
29.9
29.95
29.8
50°
60°
70°
80°

your home. Compare this circle with others on the map. Notice that some are different from others. The circles show the kind of weather at each station. If the circle is clear, the weather at the station was reported clear. Find a station that reported clear weather. If the circle is half black, the weather was reported partly cloudy. A circle that is all black shows very cloudy weather. An R in the circle means it was raining at the station at the time of the report. Find a station that reported rain. An S in the circle stands for snow, and an F shows fog.

The arrows attached to the circles on the map show the direction of the wind. The arrows fly with the wind; that means that the arrows point in the same direction that the wind is blowing. Find an arrow and decide from which direction the wind was blowing at that station.

Stations that report the same temperatures are connected by dotted lines. These lines are called isotherms. Find a dotted line on this map. What temperature did all the stations that are connected by that line report?

All stations that report the same air pressure are connected by solid black lines. These lines are called isobars. Find a place on the map marked "High." A "High" is a place where the air pressure is high. Scientists have found out that in "Highs" the weather is usually clear and cool. Find a place that is marked "Low." "Low" means a place where the air pressure

is low. When the air pressure is decreasing, the weather usually becomes stormy and warmer. These places of high pressure and low pressure move continually. If you will collect the daily weather maps for two weeks, you will be able to see that the "Highs" and "Lows" move across the United States usually from west to east. By studying the map, the forecaster can tell when and where to expect clear weather and when and where it is likely to be stormy.

If a part of the map is shaded, that part of the country had rain or snow during the past day.

On most weather maps there is a key in the lower left-hand corner that explains the symbols used on the map. They are usually those we have just explained.

Can You Read a Weather Map?

1. Find the station at Wichita, Kansas, and answer the following questions about the weather at that station.

a. What kind of weather was reported at that station?

b. From which direction was the wind blowing?

c. What air pressure was reported by that station?

d. Find another station that reported the same air pressure.

e. What temperature did the Wichita station report?

f. Find another station that reported the same temperature.

2. Find the station on this map that is nearest your home. Answer the following questions about the weather at this station.

a. What was the condition of the sky at this station?

b. From which direction was the wind blowing?

c. Was the station in either a "Low" or a "High"?

3. Find a station in northern California that reported fog.

4. Find a station in southern Texas that reported rain.

5. Find the parts of the United States that had rain at some time during the last twenty-four hours.

III. READING A WEATHER FORECAST

Is there a weather report in your newspaper? Can you read it and report to your class what weather to expect? This lesson will help you to read weather forecasts.

Just as soon as the forecast is made by the forecast centers or the larger stations, it is telegraphed to more than a thousand places in the United States. From these places, it is spread still farther by telegraph, telephone, radio, and mail. The United States government pays most of the cost of sending out weather forecasts. The newspapers also spread the information, for many of them print the daily weather

CHICAGO, ILL., FRIDAY, JULY 22

FORECAST DISTRICT CENTER

For Chicago and vicinity, partly cloudy tonight and Saturday, unsettled at times; not much change in temperature; gentle shifting winds.

Outlook for Sunday, generally fair.

Illinois and Indiana, more or less unsettled tonight and Saturday; little change in temperature.

Lower Michigan, mostly unsettled tonight and Saturday, probably local showers; little change in temperature.

Upper Michigan, unsettled tonight and Saturday, showers probable; little change in temperature.

Wisconsin, partly cloudy to cloudy tonight and Saturday, showers this afternoon in extreme east portion; little change in temperature.

Missouri, somewhat unsettled tonight and Saturday; little change in temperature.

Iowa, partly cloudy tonight and Saturday; little change in temperature.

Minnesota, generally fair tonight and Saturday, except unsettled in northeast portion tonight; slightly warmer Saturday in northwest.

North Dakota, generally fair tonight and Saturday; somewhat warmer Saturday and in west and north-central portions tonight.

South Dakota, generally fair tonight and Saturday; somewhat warmer Saturday in west.

Nebraska, generally fair tonight and Saturday; slightly warmer Saturday in west.

Kansas, partly cloudy tonight and Saturday; not much change in temperature.

Ohio, generally fair tonight, followed by local thundershowers Saturday; little change in temperature.

reports. Radio stations give several daily broadcasts about the weather.

On page 257 a copy of a part of a forecast that was sent out from Chicago is given. The daily weather reports in newspapers are somewhat like this forecast, although some papers give the report in more detail than others.

Notice the report for Minnesota. It reads "generally fair tonight and Saturday." That means that most of Minnesota will have clear weather on Friday and Saturday. However, notice that the report states, "except unsettled in northeast portion tonight." From this one understands that in the northeast part of the state the weather on Friday night is likely to be cloudy, with probable rain. Finish reading the weather report for Minnesota. "Slightly warmer" means only a few degrees warmer, perhaps three or four degrees warmer. For what part of Minnesota is warmer weather predicted? For what day was this prediction?

Because it is difficult for the scientists to get all the facts, some of the weather forecasts are not entirely correct. Then, too, we must remember that forecasts are made for large areas. Although a forecast may not be correct for a certain place, it may still be correct for the large area for which it was given. In spite of these difficulties, the forecasts that are made by the United States Weather Bureau are right nine times out of ten.

Can You Read a Weather Forecast?

If you are able to answer correctly the questions below, you should have little trouble in reading the forecasts that are in your newspaper.

1. What is the date of this report?
2. For what days is this report given?
3. What weather station gave this information?
4. For how many states is this forecast made?
5. Is the weather prediction the same for all parts of Minnesota?
6. What weather is forecast for eastern Wisconsin?
7. What weather is forecast for North Dakota for Saturday?
8. Judging from this forecast, should you expect much cooler weather in Chicago on Saturday?

How Accurate Is the Weather Forecast?

You may be interested in finding out how nearly right the forecasts are for your own district. Follow the forecasts for five days, noticing especially what is said about each of the following points:

1. Fair or cloudy (condition of the sky)
2. Rain or snow
3. Temperature
4. Wind

Each day compare the forecast made the day before with the actual weather on that day. For each point, mark the forecast right or wrong.

Safety for Pedestrians

You may think of an automobile accident as one in which people in automobiles are hurt. But each year many pedestrians, or people on foot, are also injured in such accidents. In fact, forty out of every hundred persons killed in automobile accidents are pedestrians.

When either pedestrians or drivers become careless, there is great danger of accidents, and when both are careless, trouble is sure to come. Neither can afford to take chances. In case of accident, the pedestrian is almost certain to be injured, whether he is to blame or not. Drivers who are to blame for such accidents are likely to be fined, to lose their driver's license, or to be put into prison. However, no driver, whether he is to blame or not, wishes to injure anyone.

Pedestrians have just as much right to use the streets and roads as do the drivers of cars. Indeed, in most states pedestrians, rather than drivers of cars, have the right of way at all intersections where there are no traffic lights. This means that cars must stop, if necessary, to allow pedestrians to cross the street in safety. If drivers would remember the rights of pedestrians, there would be far fewer accidents on our streets and roads.

It is foolish, however, for any pedestrian to take chances with his life just because he has the right of

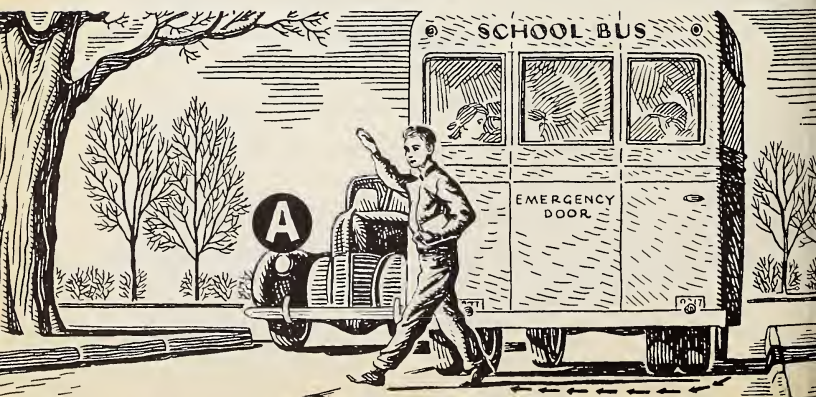
way. The fact that a person who is hit by a car has the right of way does not mend his broken bones.

This lesson tells about five automobile accidents that really happened. Read carefully about each accident and study the picture that shows how it happened. Then ask yourself these questions:

1. How did the accident happen?
2. Who was to blame?
3. How could the accident have been prevented?

ACCIDENT ONE

Larry, aged ten, had ridden home from school on the bus. As the bus drew near his home, he saw several of his friends on the porch waiting for him. He was eager to join them. Larry's home was across the street from the bus stop; so when the bus stopped, he hurried around the back of it and started across the street. He was so interested in meeting his friends that he did not look to see if any cars were coming. As he stepped into the middle of the street from be-



hind the bus, he was struck by a car driven by Mr. A. Larry was badly injured.

Mr. A was driving as fast as the speed law allowed, but no faster. He said he could not stop in time to prevent the accident because Larry had come so suddenly into the path of his car.

Can You Make Judgments from Your Reading?

Read each of the following questions and decide whether the answer is *Yes*, *No*, or *I am not sure*. Give a reason for your decision.

1. Do you blame Larry for not seeing Mr. A's car?
2. Should Mr. A have thought it possible that someone might suddenly step from behind the bus?
3. Would it have been wise for Mr. A to slow down when he met a standing bus?
4. Are there certain times when Mr. A should not drive so fast as the law allows?
5. Is it fair to expect motorists to look out for children who do not look out for themselves?
6. Was any one person entirely to blame for this accident?
7. Would it have been safe for Larry to have crossed the street in front of the bus?
8. Should Larry have stepped to the sidewalk and waited for the bus to pull away before he crossed the street?
9. Could Larry have prevented this accident?
10. Could Mr. A have prevented this accident?

ACCIDENT TWO

Martha, aged eleven, and her chum, Alice, were starting home from school. Martha stayed to chat with some friends while Alice walked across the street to the opposite corner, where she stopped to wait for Martha. When Martha decided to join Alice, she ran diagonally across the street; or jaywalked, as it is called. She kept looking back over her left shoulder, talking and waving to her friends. She paid no attention to the car that was nearing the corner. Mrs. A, the driver, slowed down but did not sound the horn for fear of frightening Martha. She felt sure that Martha would look up and see her. Martha was knocked to the street and badly injured.

Can You Make Judgments from Your Reading?

Read each of the following questions and decide whether the answer is *Yes*, *No*, or *I am not sure*. Give a reason for your decision.

1. Was Martha old enough to know better than to jaywalk?
2. Should Mrs. A have stopped her car when she saw that Martha was not looking?
3. Does this accident show that Mrs. A was not a careful driver?
4. Was anyone to blame for this accident?
5. Was it wise of Mrs. A not to sound her horn?
6. Was it wise for Mrs. A to believe that Martha would look out for herself?
7. Is it ever wise to look back and talk to people on the sidewalk while crossing a street?
8. Should Alice have warned Martha of her danger?
9. Could Mrs. A have prevented the accident?
10. Could Martha have prevented the accident?

ACCIDENT THREE

Pete and Roy, both aged ten, tried to pick up a ride to the football field, but they did not have any luck. Finally Pete decided to try to climb into a passing truck. He told Roy to follow him. Roy, who was smaller, was afraid, but he did not want Pete to think him a coward. Pete managed to pull himself into the

truck. Roy grabbed a bar on the back of the truck, but the truck was going too fast for him. He had to let go and fell to the street. Before he could get up and out of the way, he was run over by Mr. B's car.

Mr. B said that he had been following the truck for some distance. He had watched Roy running along behind the truck and thought that the boy would be able to climb into it safely.

Can You Make Judgments from Your Reading?

Read each of the following questions and decide whether the answer is *Yes*, *No*, or *I am not sure*. Give a reason for your decision.

1. Did the motorists have a right to refuse these boys a ride?

2. Since motorists refused these boys a ride, do you think the boys had a right to hook a ride?

3. If this truck had been standing still so that the boys could have climbed in safely, would it have been all right for them to hook a ride?

4. Do you blame Roy for trying to hook a ride in order not to be called a coward by Pete?

5. Was Mr. B to blame for this accident because he did not slow down enough?

6. Was the truck driver responsible for the two boys' safety?

7. Do you believe there should be a law against hooking rides?

8. Was Roy more to blame for this accident than Pete?

9. Could Pete have prevented the accident?

10. Could Mr. B have prevented the accident?

ACCIDENT FOUR

Bob, aged nine, and some of his friends were playing football on a vacant city lot. The boys were using this vacant lot because it was the only good place to play in their neighborhood. One of the boys kicked the ball so that it rolled into the street. Bob ran after it, because he was afraid that Mr. B's car, which was coming down the street, might run over his football. He did not see Mr. A's car coming from the

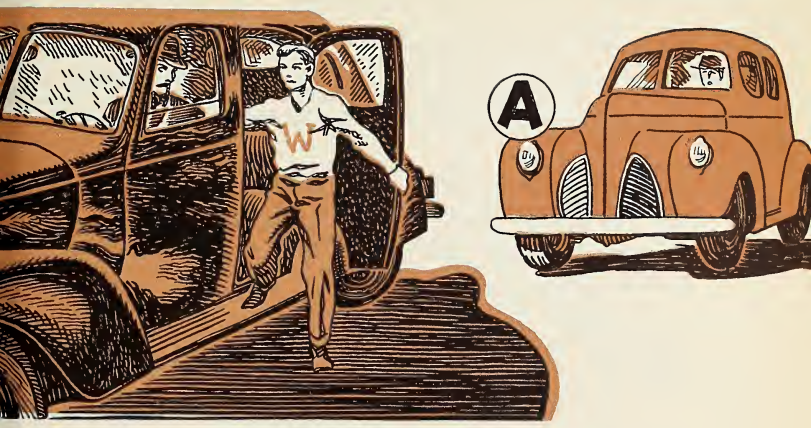
other way. Mr. A tried to stop when he saw Bob, but his car skidded and struck the boy.

Mr. A had seen the ball roll into the street, but he did not sound his horn or slow down until he saw Bob. He said he did not expect anyone to run out in front of his car.

Can You Make Judgments from Your Reading?

Read each of the following questions and decide whether the answer is *Yes*, *No*, or *I am not sure.* Give a reason for your decision.

1. Was it wrong for these boys to play on the vacant lot without permission?
2. If Mr. B had ruined the football, should he have bought Bob a new one?
3. Do you blame Bob for running into the street to save his football?
4. When a football rolls into the street, should a motorist expect some boy to run out after it?
5. Should you call Mr. A a careless driver because of this accident?
6. Can the city be blamed because there was no playground for these boys?
7. Was any one person entirely to blame for this accident?
8. Would Bob have run out after his ball if he had stopped to think of the dangers of running into the street?
9. Could Mr. A have prevented the accident?
10. Could Bob have prevented the accident?



ACCIDENT FIVE

Tom, aged fifteen, had a Saturday job in a store. One Saturday morning he overslept, and his father took him to work in his car. His father stopped the car across the street from the store where Tom worked. Tom hurriedly opened the left-hand door of the car and started across the street. As he did so, he was struck by a car driven by Mr. A.

Mr. A sounded his horn when he saw Tom's father stop at the curb. After he had given this warning, he paid no more attention to the car or its passengers. Mr. A said that he could have stopped in time to prevent the accident if he had known what Tom was going to do. However, he thought that no one would step out of the car on the left side.

Can You Make Judgments from Your Reading?

Read each of the following questions and decide whether the answer is *Yes*, *No*, or *I am not sure.* Give a reason for your decision.

1. Since Tom was so eager to reach the store on time, should he be blamed for this accident?
2. Was Tom's father wise in stopping across the street from the store?
3. Was it fair of Tom to expect motorists coming up behind his father's car to stop while he crossed the street?
4. Did Tom's father have a right to believe that Tom could take care of himself?
5. Was any one person entirely to blame for this accident?
6. Does this accident show that Mr. A was a careless driver?
7. Should Mr. A have expected Tom to step from the left side of the car when it stopped in front of him?
8. Does this accident show that Tom's father was a careful driver?
9. Could Tom have prevented the accident?
10. After he sounded his horn, what should Mr. A have done?
11. Should Tom's father have driven around the block in order to let Tom out on the same side of the street that the store was on?
12. Should a person ever step into the street from the left side of a car without looking to see whether or not another car is coming?

How Well Do You Understand Safety Rules?

From what you have just read about these accidents, you should be able to understand why it is important for pedestrians and motorists to follow safety rules.

Below are twelve rules for pedestrians. Number your paper from 1 to 12. Put a check (√) opposite the number of each rule that, if followed, would have helped to prevent any one of the five accidents.

Put a dash (—) opposite the numbers of any rules that you think are especially important for pedestrians on country roads. *Do not write in this book.*

RULES FOR PEDESTRIANS

1. Cross at street crossings only.
2. Look left, then right, before crossing a street.
3. Do not run in front of automobiles.
4. Obey colored traffic lights and other traffic signals.
5. Do not steal rides on automobiles or trucks.
6. Face front when you get out of a bus or automobile.
7. Do not hitch on to moving cars.
8. Look out carefully for traffic when you chase anything in the street.
9. Do not play in streets and public roads.
10. Remember that automobiles cannot stop as quickly as pedestrians.
11. Always walk on the left side of a highway or country road, facing the traffic.
12. Get out on the right side of an automobile, then step to the sidewalk before crossing the street.

The Apple Industry

I. THE STORY OF THE APPLE

Thousands of years ago, apples grew wild in western Asia where wandering tribes of people gathered them for food. These wild apples were hard and sour and no larger than small rubber balls. However, since they were the best apples known at that time in western Asia, the people prized them. In old stories that have come down to us from those early days, these apples are spoken of as the finest of fruits. They were probably little different from the wild, sour crab apples that early settlers found growing in America.

Later, but still more than two thousand years ago, the Romans, who were good farmers, knew of many

kinds, or varieties, of apples. By the time America was being settled, apples were being grown in all parts of Europe. So it was natural that colonists coming to America should bring apple seeds, and even young trees, with them. Soon apple orchards grew up in most of the settlements of the New World.

Then, as traders and missionaries went farther and farther into unsettled parts of the country, they carried apple seeds with them. Sometimes they gave them to the Indians, who liked this fruit and did much to spread the seeds. Soon orchards could be seen growing near many Indian villages.

As time went on, white settlers went farther and farther west. After they crossed the mountains and built new homes in the Ohio River valley and farther westward, they began to set out apple trees near their homes and in their settlements. Pioneer homes were made beautiful in the spring by the blossoming of apple orchards. People were glad to have the delicious fruit. Pioneer women dried the apples. They also made jelly and thick spicy apple butter after the fruit had been harvested in the late summer and fall.

No story of the apple in these settlements is complete without mentioning the man who did more than any other person to plant apple trees in newly settled parts of the country. His real name was John Chapman, but everyone called him Johnny Appleseed, for he was known from one end of the western country to the other for the bags of apple seeds he gave away.

Little is known about the strange life of this man, who was friend to both white man and Indian. Only a few stories are left to tell us of his work, but we do know that from 1801 until his death in 1847, he roamed the settlements of Ohio and Indiana, starting apple orchards and planting trees wherever he went. He used to stop parties of settlers who were going farther west and give them small trees to carry to their new homes. If they could not take the trees, he would give them small deerskin bags of seeds, if they would promise to plant them. Soon his apple trees were bearing fruit over an area of 100,000 square miles.

Small beginnings sometimes lead to big results. Today the United States is producing more apples than any other country in the world. The yearly crop, which is from 120 to 200 million bushels, is worth from 100 to 200 millions of dollars. Washington produces more apples than any other state in the United States. In a recent year it produced almost one fourth of the total crop. Other leading apple-producing states are New York, Pennsylvania, Virginia, and Michigan.

Apples are raised both for meeting our own needs and for shipping to foreign countries. Different varieties are grown in order that we may have apples during different seasons of the year. Some kinds of apples are grown because they ripen early, by midsummer. These varieties are called summer apples. Others, grown because they ripen in the fall, are called fall apples. Still others, which do not ripen until just before the coming of winter, are known as winter apples. Applegrowers like to have some of each variety, so that there will be apples ripening each month from midsummer to late fall. When they manage this, they have apples to sell over a much longer period of time.

The apples that ripen late in the season are likely to keep best. Some varieties of winter apples can be stored for a long time without rotting or becoming soft and mealy. Such fruit is especially valuable because it can be kept in storage until the next season's crop of summer apples is ripe and ready for sale.

Applegrowers have always tried to store apples, if only for their own family use. Fifty years ago people had only cool cellars or "apple holes" outside their houses for such storing of winter apples. An apple hole was a pit dug in the ground and lined with straw. Apples placed in it were covered with layers of straw, and then with earth. When apples were needed during the winter, the farmer dug away the snow and frozen earth and brought out fresh, cold, crisp fruit.

Nowadays winter apples are stored in large cold-storage plants, where the temperature is always just right for keeping the fruit at its best. From these storage plants apples are taken out only as they are needed for sale. This makes it possible for city people, who could not possibly keep large supplies of apples in their houses all winter, to have them on their tables every month of the year.

Time of ripening is not the only thing the applegrowers think about when they are planning their crop. They try to raise varieties which will be especially good for different purposes. Some apples are especially good for making applesauce, some for pies, and some for baking. Others are not very good for cooking, but they are good to eat raw. They are spoken of as "eating apples."

The chart on page 277 gives the names of some of the best-known varieties of apples, the time of year when they ripen, and the uses for which they are especially good.

Time of Ripening	*Variety*	*Uses*
Summer	Early McIntosh	Baking; sauce; eating
	Duchess of Oldenburg	Eating; sauce
	Maiden Blush	Drying; pies; eating
Fall	Wealthy	Cider; drying; baking; eating; jelly
	Fameuse	Jelly; eating
	Rhode Island Greening	Pies; sauce
Winter	Grimes Golden	Baking; sauce; eating
	Jonathan	Eating; baking
	Delicious	Eating

Can You Read a Chart?

In order to get information from a chart such as that above, you will need to know how to read it. For example, if you want to find all the information that is given about summer apples, you read across the chart. If you want to find the names of different kinds of apples, you read down the column that is headed *Variety*. The following questions will show how well you can read this chart:

1. How many varieties of summer apples are given in the chart?
2. For what three uses are the Early McIntosh apples good?
3. Which variety of summer apples is good for drying?
4. Which variety of fall apples is used in the most ways?

5. For what two uses is the Jonathan apple good?

6. Which variety of winter apples is used chiefly for eating?

7. How many varieties of apples are given on this chart?

8. How many different uses for apples are mentioned on this chart?

II. GROWING APPLES

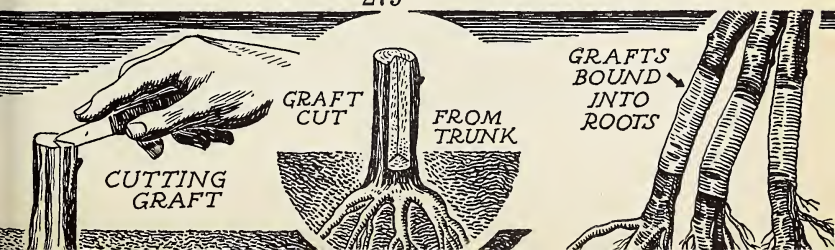
In Johnny Appleseed's time, most apple trees grew from seeds. But today applegrowers do not usually grow their trees from seeds. They buy young trees from nurseries, which are places where trees and other hardy plants are grown for sale.

There are two ways of growing apple trees. First, seeds may be planted, which grow into trees known as "seedlings." The fruit from seedling trees is often poor, however, and no one can tell just what kind of fruit these trees will produce. Even if seeds from one of our finest apples were planted, the trees that grew from them might produce very poor fruit. Nor could two of the seedling trees be counted on to bear fruit that was just alike. No one can know beforehand just what kind of fruit will come from a tree that grows from seed. These seedlings are most valuable not for their fruit, but for furnishing the roots into which buds or twigs from other trees are set, or "grafted."

There is a second way of growing trees, and that is by grafting. In a nursery a cutting of a bud or

twig from a tree that bears especially good fruit is set, or grafted, into the roots of a young seedling. The bud or twig and the root that have been grafted together grow as a single tree. But no one need have any doubt as to what kind of fruit this grafted tree will bear. Its apples will be just like those of the tree from which the cutting was taken. Most apple trees are grafted because growers want to be sure that their trees will produce certain well-known varieties.

Sometimes, however, an important new variety of fruit will be discovered on a seedling tree. One of the most famous seedlings produced the Golden Delicious apple. It was found growing far up on a West Virginia mountainside. Paul Stark, the man who found this tree in 1915, paid five thousand dollars for it, because for years he had been looking for just such an apple. He had been searching for a pure yellow winter apple which would keep well, grow large, and have a fine flavor. The tree that bore it must be a strong tree. When he found this seedling, he left it growing on its mountainside. But he had it enclosed in a burglarproof wire cage, so that no one but he or his men could take cuttings from it for grafting. Thousands of Golden Delicious trees are now sold every year.



Paul Stark is a member of a family of nurserymen that has done much toward improving the kinds of apples raised throughout the world today. In 1816, his great-grandfather, Judge James Stark, stuffed his saddlebags full of apple cuttings and rode to Missouri from Kentucky, where his father had pioneered with Daniel Boone. Soon he started the first nursery west of the Mississippi.

Clarence Stark, Paul Stark's father, discovered the Delicious apple on a seedling tree in Iowa in 1894. He bought the tree, and about thirty million Delicious apple trees have been grown from it and from trees like it. There are more Delicious apple trees planted throughout the world than of any other single variety.

Trees of a new variety like this will be shipped all over this country and all around the world. Trees of a particular variety developed from a single seedling

in one nursery can be found today growing in orchards from Canada to Mexico, and from New England to the Pacific coast. When a new variety is wanted abroad, the nurserymen pack the little trees in airtight cases lined with frostproof paper and ship them to Europe, Asia, and Australia. Soon these trees will be found in every part of the world where apples are grown. Yet every one can be traced back to a particular nursery and, perhaps, to a single seedling.

The apples we know today have been developed, for the most part, from unusually fine seedlings. But nurserymen are now paying more and more attention to what they call "bud sports." A bud sport is a bud, twig, or branch of a tree that is found to be different in one or more ways from the parent tree on which it is growing. The apples that grow on this branch or twig may be different in size, in color, or in flavor from those on the other branches of the same tree. If cuttings from such a bud sport are grafted on other roots, whole trees can be grown, which will produce fruit exactly like that which grew on the one unusual twig or branch.

Worth-while sports are rare, but growers are watching their trees for them. The most valuable sports yet found have been those which produce fruit of better color than that from the rest of the tree. Solid-red apples are much desired by buyers. In recent years solid-red varieties of Jonathan, Stayman Winesap,

Duchess of Oldenburg, and Delicious apples have been developed from bud sports. These apples turn a deep, dark red before they become fully ripe. Buyers like these apples because they may be picked unripe. For this reason they last longer in storage, and yet they have a deep, dark-red color.

High prices are paid for such bud sports. When such a one was discovered in New Jersey a while ago, a nurseryman was willing to pay six thousand dollars for that one limb. He could afford to do it because he knew that, from that single branch, he could grow thousands of trees bearing apples just like the fine dark-red fruit on that one unusual limb.

It is not only the owners of nurseries, however, who are trying to develop better apples. Many states have experiment stations in which men are working to grow new varieties of apples and to find out ways of protecting orchards from diseases. The Department of Agriculture of the United States government is also trying to help people who grow apples. It publishes many valuable bulletins which can be obtained free or at small cost.

It is easy to see that the apples grown today are much better than the first small, sour apples that grew wild in western Asia and in America. The apples we eat are even much better than those our own grandparents had. Every year better varieties are being developed, and we feel sure that apples can still be greatly improved.

How Well Can You Complete Sentences?

Below are sentences from which one or more important words have been omitted. Number your paper from 1 to 10. After each number write the words that should be filled in the blanks. *Do not write in this book.*

1. Today fruitgrowers do not usually grow their apple trees from ___?___, but buy ___?___ ___?___ from nurseries.

2. Fruit trees may be grown in two ways: from ___?___ or by ___?___.

3. Trees grown from seeds are called ___?___, and often produce ___?___ fruit.

4. Trees are grown from cuttings that have been ___?___ into the roots of a seedling.

5. You cannot tell what kind of fruit will come from a ___?___, but you can usually tell what will come from a ___?___ tree.

6. A seedling found on a mountainside was bought for ___?___ ___?___ dollars.

7. Trees grown from a single seedling may go to all parts of the ___?___.

8. A bud, twig, or branch that is different from the parent tree is called a ___?___ ___?___.

9. The most valuable bud sports have produced fruit of a better ___?___.

10. Apples today are ___?___ than they were in the days of our grandparents, and will probably be ___?___ in a few years.

Can You See Relationships between Words?

I. CHOOSING RELATED WORDS

If you are able to see relationships between words, you probably understand their meanings very well. In each of the twelve lists of words given below, there are two pairs of words that have the same relationship. One pair of words is outside the parentheses. Look at the first list. Do you see the two words *sugar* and *beets* outside the parentheses? What is the relationship between these two words? Is it that sugar is made from beets? Now look at the words within the parentheses. Do you find any two words that have this same relationship to each other? Did you choose *flour* and *wheat*? Flour is made from wheat.

In the other eleven lists find the two words within the parentheses that have the same relationship to each other as those outside the parentheses have. Be sure you understand the relationship of the outside pair before you try to pick the inside pair. Number your paper from 1 to 12. Write the words taken from inside the parentheses opposite the numbers on your paper.

1. sugar · beets (coffee · tea · flour · salt · wheat)
2. artist · picture (doctor · teacher · author · lawyer · story)
3. cat · kitten (dog · sheep · cow · puppy · horse)
4. sweet · sour (green · black · blue · white · yellow)
5. airplane · air (train · ship · wagon · sea · car)

6. electricity · electric fan (gasoline · wood · coat · automobile · kerosene)

7. cattle · hides (horse · hen · sheep · wool · dog)

8. young · old (queer · weak · happy · bad · strong)

9. bread · flour (tire · stone · glass · wood · rubber)

10. fish · swim (dog · bird · horse · fly · elephant)

11. carpenter · hammer (sailor · gardener · doctor · hoe · miner)

12. snow · white (grass · pavement · sky · green · clouds)

II. GIVING OPPOSITES

In each of the following sentences fill the blank with the word which means the opposite of the word in italics. *Do not write in this book.*

1. It is *foolish* to waste your money, but it is ___?___ to save it.

2. It is *polite* to talk quietly; it is ___?___ to talk in a loud voice.

3. It is *safe* to cross a street at the corners, but it is ___?___ to cross in the middle of the block.

4. Children may be *noisy* on the playground, but they should be ___?___ in public buildings.

5. A city with clean streets is *beautiful*; a city with dirty streets is ___?___.

6. An *honest* person looks for the owner of an article that he finds; a ___?___ person keeps the article.

7. If a person is *careful*, he looks before crossing the street; if he is ___?___, he crosses the street without looking.

III. FINDING WORDS THAT ARE OUT OF PLACE

Below are fifteen groups of words. Four of the words in each group are related because they belong in the same class. One of the words does not belong. For each group of words find the one word that is out of place. First decide into what class four of the words fall, and then decide what word does not belong.

On your paper write the three headings given below. Under the first heading number from 1 to 15. Notice that the first number is already filled in for you. Fill in the other fourteen.

Number	*Class*	*Word that does not belong*
1	nuts	apples

1. almonds · walnuts · apples · butternuts · peanuts
2. wagon · tree · automobile · carriage · truck
3. schoolhouse · store · church · library · train
4. knife · plate · fork · broom · cup
5. mountain · valley · plain · plateau · silver
6. river · hill · lake · pond · stream
7. corn · wheat · oats · rye · sawdust
8. pencil · pen · chalk · tablet · crayon
9. autumn · rain · winter · spring · summer
10. doctor · dentist · lawyer · child · merchant
11. coffee · tea · potatoes · milk · cocoa
12. door · window · steps · porch · yard
13. lion · tiger · sheep · bear · wildcat
14. hearing · seeing · smelling · tasting · jumping
15. leaves · stems · twigs · ground · roots

The Beaver People

Away beyond the settlements of southern Canada lies a wild, almost unknown, forest country. This is one great part of North America that has remained much the same as it was before the white man discovered it. Very few white people live there, even today. Besides the few trappers and traders, the only human beings who live there are scattered bands of Ojibway Indians. They have made this land their home, calling it the Land of the Northwest Wind. It is this forest country which Grey Owl describes.

A story such as this one is read for two reasons. One is for the enjoyment or fun of reading such an interesting story. The other reason is to learn something. At the same time that you read this story for the fun in it, watch for interesting facts about the Ojibway Indians and beavers.

I. THE FIRST ADVENTURE

Big Feather was an Ojibway Indian. He had paddled against the strong current of the Yellow Birch River for many days and was now far from his village. He was a little lonely, for back in the village, now so far away, he had left his two young children, a girl and a boy. Their mother had died, and he knew that they must be lonesome, too.

Big Feather stopped near some giant pine trees and cooked his noon meal. After he had eaten, he smoked quietly for a little while. Soon after covering

his small outfit with the overturned canoe, he took his gun and walked up along a little stream. He was on his way to the beaver pond that he knew must be near. His moccasins made no sound and left no track. He walked softly in the quietness and peace of the sleepy forest. Suddenly he stopped, listening. His keen ears had caught a strange, unexpected sound, which quickly became louder and louder. Then he saw a rush of yellow, muddy water coming swiftly down the stream bed toward him. Something terrible was happening up at the beaver pond! It could be only one thing: some man or animal must have torn out the beaver dam.

In a moment Big Feather was leaping and tearing his way through the forest. He raced at top speed to save his beaver colony from ruin. He hoped that he would be in time. Now he suspected what had happened. The otter, one of the worst enemies of all the Beaver People, was on the warpath. With their water gone, the beavers must even now be fighting for their lives.

Big Feather jumped from one rock to another until he was close beside the beaver house. He saw the otter leave. He watched the father and mother beavers repair the dam. However, he was still a little anxious. He had seen the four baby beavers rush out from their house, but had not seen them return. So he sat down on the shore and watched. Soon he saw the mother beaver coming to collect her little ones, one at a time. Two of them had come out of hiding. As she came for them in turn, each would mount upon her broad, flat tail, which trailed behind her like a short toboggan. Standing upright on it and holding onto his

mother's fur with his tiny hands, each baby was dragged across the mud to the doorway. The little fellows looked around them as they rode, taking in all the sights. No doubt they felt extremely pleased with themselves. Big Feather got as much fun out of it as they did. He saw two of them taken home in this way, and laughed to himself at the funny sight.

Big Feather made up his mind to stay all night. The otter might return, or another one come. But none did. When he left next morning, he saw that the pond had filled up completely, and the water was running over the dam as before. The secret doorway leading to the beaver house was hidden again.

Big Feather did not know that two of the beaver kittens had scrambled away and become lost. Being too small to swim against the current of the stream, they went the easiest way and floated with it. Down, down the stream, farther and farther away from their home, they slipped.

On they floated, weak and hungry for want of the leaves and plants they did not know how to look for. Then, as they floated out onto the broad, quiet waters of the Yellow Birch River, Big Feather saw them. He quietly paddled his canoe over to them. They heard him, opened their eyes a little, and saw him. Somehow they were not afraid when he lifted them into the canoe by their tiny black tails.

Big Feather handled them gently, for they were very small. Their wee front paws were tucked up in

feeble little fists, as though to put up some kind of fight for their tiny lives. The chubby heads were too heavy and dropped down, and their eyes were closed. Big Feather knew they must be dying, and he was sorry for them.

He would try to save them. On shore, he took a can of milk from his supplies. He mixed some of it with water and poured it into their mouths. As he fed them, they clung tightly to his fingers with their tiny hands. His heart softened more and more toward them, though he hardly knew what he was going to do with them. He had little time to spare. He had promised Sajo (sā′jō) and Shapian (shăp′ē an), his children, that he would be back on a certain day, and he did not want to disappoint them. If he carried the beaver kittens back to the pond, they might never find their way across. If he let them go here, they would certainly starve or some animal would get them. But he had far to go, and they would be a nuisance.

Sajo, Big Feather's little daughter, was nearly eleven years old and was soon to have a birthday. The beaver kittens would make a fine present—the very thing! And when they became too big for pets, they could be brought back to their old home again.

So Big Feather took the baby beavers home with him.

Can You Find Interesting Paragraphs in This Story?

In most stories there are some paragraphs that you like better than others. Find the paragraph in this story that you enjoyed the most and plan to read it orally to your class. If you have trouble choosing an interesting paragraph, the following suggestions may help you to find one.

1. One can often tell what kind of person someone is by what he does. Find a paragraph that tells about something Big Feather did. After you have finished reading the paragraph orally, ask the class to suggest a word that describes Big Feather.

2. Some paragraphs paint very clear word pictures. Find the paragraph that tells how the mother beaver carried the beaver kittens back to their home. Could you draw an illustration of that paragraph?

3. Some paragraphs are entertaining because they describe an exciting or unusual incident. Find the paragraphs that tell how Big Feather saved the little beaver kittens.

What Did You Learn from This Story?

Grey Owl, the man who wrote this story, tells us that everything that is told about beavers in this story is true. The incidents in this story happened either to him or to his friends. In as few words as possible answer the following questions:

1. What people live beyond the settlements of southern Canada?
2. What is one way in which these people travel from place to place?
3. What animal is an enemy of the beaver?
4. How do mother beavers carry the beaver kittens?
5. Where do beavers build their homes?
6. What keeps the water in a beaver pond?

II. SUMMER WITH THE LITTLE BEAVER PEOPLE

The kittens quickly took a liking to their new way of living. Everything possible was done to make them comfortable.

Shapian divided off the under part of his bunk with sheets of birch bark, leaving one end open. This was the beavers' house, where they at once made themselves very much at home. Big Feather cut a hole in the cabin floor and fitted a washtub down into it. This was the little beavers' pond. They spent about half their time in it, and would lie on top of the water eating twigs and leaves.

The two beaver kittens had to have milk during the first two weeks, so Sajo borrowed a bottle and a baby's nipple from a neighbor in the village. She fed them turn about, as they squeezed both hands tight around the neck of the bottle. But while one would be getting his meal, the other would scramble around, make a loud noise, and try to get the bottle. There would be such a squabbling that the milk was sometimes upset. At last another bottle and nipple had to be found. Then Shapian fed one kitten while Sajo fed the other.

Later on, they were fed milk and bannock, a kind of Indian bread. Each little beaver had his own small

dish which the children held for him. The babies would pick up the mixture with one hand and shove it into their mouths at a great rate. Their table manners were not very good. There was a good deal of loud smacking of lips, and they often talked with their mouths full.

They often sat upright while eating the bark off small sticks. As one held a stick crossways in his hands, rolling it round and round while his busy teeth whittled off the bark, he looked for all the world like a little old man playing on a flute. When the sticks were very slim, they ate the whole thing, putting one end in their mouths and pushing on it with their hands. The sharp front teeth, working very fast, chopped it into tiny pieces. Their eating sounded much the same as a couple of sewing machines running a little wild. It looked as if they were shoving the sticks slowly down their throats.

The little beavers were a great pair of talkers. Whenever either of the children spoke to them, which was often, they nearly always answered with little cries and squeals. When there was any work going on around them, such as carrying in water or wood, or sweeping the floor, the two of them would come bouncing out to see what it was all about. If people laughed and talked more than usual, or if there were any visitors, they would try to join in. They would do all kinds of tricks, and get pretty much in the way.

They also liked to follow the children around. Their legs were so very short and they ran so low to the floor that their feet could hardly be seen.

Anything the little beavers found on the floor, such as moccasins or kindling wood, they dragged from place to place. Later, when they got bigger and stronger, they even stole sticks of firewood from the wood box and took them away to their house. There they sliced them up into shavings with their sharp teeth and made their beds with them. Any small article of clothing that happened to fall to the floor quickly disappeared into the beaver house unless it was picked up at once. They pulled the broom down and hauled it around. The broom and the firewood were their favorite playthings. They seemed to enjoy greatly the noise these things made.

But the beavers' greatest amusement was wrestling. Standing up on their hind legs, they would put their short arms around each other as far as they would go. With their heads on each other's shoulders, they would try to pull each other down. This was hard to do, as the wide tails and the big, webbed hind feet made a very solid support. They would strain, push, grunt, and blow. Back and forth, round and round, for minutes at a time, they would carry on this strange game of theirs. Between the grunts and gasps, there would be loud squeals and cries from whichever one was getting pushed. Finally, one of them would allow his tail to double under him, and fall on his back.

Then they would stop wrestling and would scamper around like two children. Sajo and Shapian never grew tired of watching them.

And so the happy summer passed. Autumn came, and with it the Days of Falling Leaves. The time had come to take the beaver kittens back to their old home.

One afternoon in October, the Moon of the Falling Leaves, Big Feather and his two children were beside the home pond of the Beaver People. It was just as the sun was setting, the time when wild beavers awake from sleep. It was from here that the little beavers had first started out on their great adventure.

Big Feather drew away a short distance, while Sajo and Shapian carried a basket down to the water's edge. There, beneath a tall, silvery poplar tree, they opened it.

Shapian reached in and stroked the silky little bodies. "Farewell," he said. "Good-by, Little Brothers."

Then Shapian went over and stood with his father. Sajo was left alone. She held the little beavers close, just for a moment, and whispered into the small black ears: "Good-by, my Little Brothers. Don't let's forget—*ever*." Then she let them go.

They swam off across their own home pond. As they drew near the beaver dam, Big Feather gave a long, clear call, the call of a beaver looking for his companions. Again the sound, like a note of music, stole out into the stillness, and again. Then quite suddenly a black head appeared on the surface of the water near the beaver house, and then another.

Sajo scarcely breathed. It was just what she had

hoped for. At Big Feather's call, the beaver father and mother were really coming to meet them.

Everyone stood as still as the trees themselves, while the old beavers came slowly toward the young ones. They passed around them once or twice, looking, sniffing at them, making some low sounds. Then they swam on beside them. Big heads and little heads were all together now! The water streamed out behind them in long, rippling V's. Once or twice the Indians heard the faint, faraway sound of childlike voices. The dark heads became smaller and smaller, farther and farther away. Right before the beaver house, one by one, without a sound, they sank beneath the surface, out of sight.

The little beavers were at home.

Grey Owl

Can You Find Interesting Sentences in This Story?

Did you notice the interesting way in which Grey Owl tells a story? The sentences below give some of the same ideas that Grey Owl does, but in a less interesting way. Find sentences in the story that give the same ideas as the sentences below.

1. They made a great deal of noise when they ate.
2. The little beavers gnawed the bark.
3. The beavers were interested when the children were working.
4. The little beavers used wood to make their beds.

5. It was hard for one beaver kitten to pull the other down.

6. In October the children went to the pond where the beavers lived.

7. Sajo and Shapian opened the basket beneath a tree.

8. Sajo said good-by to the beavers.

9. Big Feather repeated the beaver call several times.

10. None of the people moved.

11. The Indians heard the voices of beavers in the distance.

12. In front of their house the beavers disappeared from sight.

What Did You Learn from This Story?

In the second part of this story you learned still more about beavers. Answer these questions in as few words as possible. When you have finished, turn back to the story to check your answers.

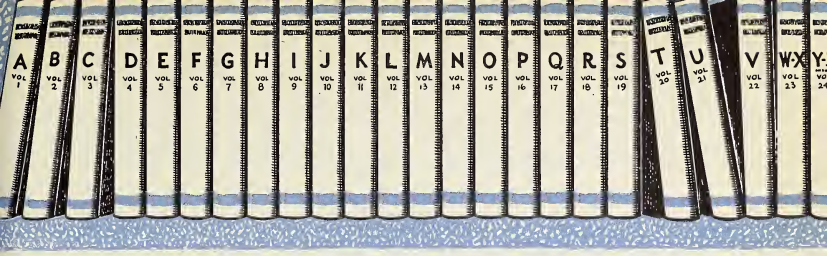
1. What do beavers eat?
2. How do beavers eat their food?
3. What kind of teeth do beavers have?
4. What kind of tails do beavers have?
5. What do their hind feet look like?
6. During what part of the day do wild beavers sleep?
7. What kind of fur do beavers have?
8. How do baby beavers play together?

Using an Encyclopedia

When you read the story "The Beaver People," you probably became so interested in beavers that you wanted to know more about them. Did you ask yourself any of these questions?

1. How large do beavers grow?
2. How do beavers build their houses?
3. How do beavers cut down trees?
4. Why do beavers build dams?
5. Do they build more than one dam?
6. How do they build their dams?
7. How valuable is the fur of the beaver?
8. In what countries are beavers found?
9. What damage do beavers do?
10. Should beavers be protected?

One of the best books in which to find more information about a topic is an encyclopedia. Encyclopedias give information about almost any subject in which you might be interested. Some encyclopedias are written especially for children. A set of encyclopedias is usually made up of a number of volumes that are arranged in alphabetical order. One volume may contain all the topics that begin with the same letter; for example, all the topics that begin with *A* may be in one volume. Another volume may include more than one letter, such as *W* and *X* or *Y* and *Z*. The topics within a volume are also arranged alphabetically.



I. CAN YOU CHOOSE THE CORRECT VOLUME?

The volumes in this picture are arranged in alphabetical order. The first volume contains all the topics that begin with *A*. In which volume should you expect to find information about beavers? In which volumes should you expect to find information about each of these topics?

Teeth	Navahos	Spiders
Cowboys	Deserts	Hummingbirds
Whales	Pony Express	Forests
Muskrats	Telephones	Iceland
Vikings	Indians	Salmon

II. HOW WELL CAN YOU READ AN ARTICLE FROM AN ENCYCLOPEDIA?

If you are interested in finding the answers to the questions about the beavers, the lesson on pages 304–308 will help you. The lesson is taken word for word from an encyclopedia and tells many things about beavers. One of the questions is answered by the picture. Another question is answered by the descrip-

tion below the picture. Read quickly to find the parts of the lesson that answer the questions. Then read these parts again, so that you can discuss the answers in class.

BEAVER. Have you ever heard the saying, "as busy as a beaver"? Anyone who has ever had the good fortune to see a colony of these water animals at work has no difficulty in understanding its meaning, for they are among the most intelligent and industrious of animals, and the dams and houses which they construct are wonderful products of animal skill.

The beaver belongs to the group of "gnawers," or rodents, and is the largest and heaviest of that family. A large beaver measures about two feet from the tip of his nose to the root of his tail, which adds about a foot more. The weight of such a specimen is about 35 pounds, but large old specimens may weigh 75 pounds. The tail is not the least curious feature of the beaver, for it is broad and flat, with a horny covering resembling scales. The front teeth are remarkably large and, like the front teeth of the squirrels, rabbits, and other gnawing animals, are hard in front and softer behind, so that by use they become worn to chisel edges. The beaver's hind feet are webbed for swimming, and the flattened tail serves as a rudder and to splash the water for a warning signal. He is a splendid swimmer and diver. Frequently he remains under water for fully two minutes.

Beavers are social animals. A family of several members usually lives in one house; and sometimes a large number of families collect together in a community. They usually work at night and build their houses or lodges well concealed from haunts of man in small lakes or ponds made by damming up a forest brook. Their houses are oven-shaped and built of sticks, grass, and moss, woven together and plastered with mud, so strong as to protect the inhabitants from beasts of prey. The room inside may measure eight feet in diameter and two or three feet in height, and the floor is carpeted with bark, grass, and wood chips. There are two entrances, both under water. One, called the beaver entrance, is often winding in its course as a protection against enemies. The other is straight and is used both for taking in the wood for winter food, and as a means of escape in case of invasion by a mink or other water enemy. Both these entrances open into a moat around the house, too deep to freeze solidly, so that the beavers are not likely to be shut in.

BEAVERS AS ENGINEERS

In order that they may easily pass back and forth under the winter's ice, and that they may have room to store food, the beavers build dams to increase the water about the lodges. These dams are often of great size; indeed one is reported 1530 feet long. The first step in dam-building is the selection of a suitable site,

a narrow place in shallow water with firm bottom. Then work is begun of felling trees. Standing on their hind legs the beavers gnaw round and round the trunk with their chisel-like teeth until the tree is ready to fall. Sometimes trees 18 inches in diameter are thus cut through by these sagacious animals.

Some say that they always plan for the tree to fall toward the water; others declare that they work haphazard. After the tree is down the beavers set to work lopping off branches and cutting the trunk into lengths which they can drag into the water. The short logs, dragged or floated to the desired spot, are sunk parallel with the current, and if the water is deep they are kept down by means of stones, sod, and mud loaded on by the beavers. Mud and stones and heavier timbers are carried in their forepaws and small timber between their teeth. There is no superintendence in their work, but each beaver does what seems to him best. The result is that the dam is usually a tangled heap, but it serves its purpose. In old dams willow and poplar logs have usually sprouted and have sometimes given rise to considerable trees.

The beaver feeds mainly on the bark of trees (willow, poplar, birch, etc.) and on roots, buds, berries, and leaves. A store of good-sized green logs is always sunk in the water at the doors of their houses for winter feeding. When the trees near the water are used up and the land is too uneven for rolling, log slides and canals are cut in the banks and bottom

The artist shows us a beaver "lodge" with one side cut away so that we can see how cleverly it is built both above and below the water line. Notice that the bedroom, for more warmth, is higher than the dining room. The hall leads down under water to the front door, which is designed to be below the thickest ice that may cover the pond in winter. The beavers drag down and anchor near this entrance a supply of green branches and bark for winter feed. Observe that the main dam is protected by two other dams farther downstream, which relieve the pressure of water on the first one.

to carry down the timbers. These channels may be hundreds of feet long and about a yard in width and depth. One of the chief uses of the beavers' dam is to insure sufficient water to float these logs.

The soft, thick, gray under-fur of the beaver has long been highly valued by man, and during the 17th and 18th centuries beaver skins held first place in the

world's fur trade. At that time, before the invention of the modern silk hats, men's hats were made from beaver skins, and hence the word *beaver* often meant "hat." So great was the demand for beaver fur that in the western part of Canada and the United States beaver skins at times passed as currency.

Beavers once inhabited most of the wooded parts of the Northern Hemisphere, but they have now been exterminated over much of their former range. In Europe only a few scattered colonies survive. In the United States they are scarce east of the Rocky Mountains, though they have recently been increasing in Maine and other states which have passed laws for their protection. They are increasing also in the Western states and in Canada, wherever a policy of conservation has been adopted.

Friends of the beaver have encountered bitter opposition because of the damage it sometimes causes by flooding tracts of valuable timber. Its good deeds, however, outweigh the bad. By building a series of dams in mountainous districts, the beavers form ponds which hold the waters of the melting snows and give them out gradually during the summer to the arid plains. Thus they help to irrigate the land. Moreover, their great economic value as a source of fur and their interesting habits should alone be a sufficient argument in favor of protecting them.

From *Compton's Pictured Encyclopedia*

Learning to Give Reasons

You have often heard people say that children are always asking "Why?" It is really a good thing that they do. It is an especially good thing to ask "Why?" as you read. When you read a statement and ask "Why?" or "Why is this statement made?" your question shows that you are thinking about what you read. It is too bad that people get over the "why" habit so early.

Cities have certain laws that are meant to protect the lives and health of their citizens. The following statements describe some of the laws in one large city. As you read each statement, ask yourself why you think such a law was made. If you can think of a good reason, be ready to tell the class.

1. A lifesaver who is skilled in swimming, in handling boats, and in reviving drowned persons must be employed at swimming pools and beaches where there are boating and swimming
2. Young children must have the written permission of their parents to use a rowboat or sailboat on a lake.
3. Certain public buildings, such as hospitals and jails, must have fire escapes.
4. Doors of public halls must open outward.
5. Poisonous medicines must have the word *Poison* on the box or bottle.
6. Bonfires must not be made in streets or in alleys.

7. Automobiles must not pass through safety zones when people are getting on and off busses or streetcars.

8. No one may fire off a gun or a pistol in the city without permission of the officers of the city.

9. The use of air guns, spring guns, and bows and arrows is forbidden.

10. Gasoline cans must be painted red.

11. It is against the law to drive an automobile faster than fifteen miles an hour in a school district.

12. Drivers of automobiles should signal for turns and stops.

13. Flowerpots, boxes, bowls, pitchers, milk bottles, and other articles must not be put upon window sills unless they are firmly fastened, so that they will not fall into the street below.

14. Stones must not be thrown.

15. Roller-skating and ice-skating in the street are not permitted.

16. Bicycles and tricycles must have headlights and taillights if ridden in the streets at night.

17. Dogs must be muzzled at all times when running on the streets, in alleys, or in other public places.

18. No children under sixteen years of age are permitted to drive automobiles in the city.

19. It is against the law for anyone to bring into the city any decayed or unwholesome fruit or vegetable to be sold to the public.

20. No person is permitted to throw on the city sidewalks the rind or peel of any fruit or vegetable, or any glass bottle or any article made of, or containing, glass.

21. Any person going from place to place to sell goods must have a physical examination to see that he does not have a contagious disease.

22. All milk that is not pasteurized must be Grade A or Grade B and be labeled as such.

23. Spitting upon the floor of any streetcar or public building or on any sidewalk is not allowed.

24. Ice or snow that has been allowed to remain on any sidewalk for ten hours will be removed by the city and be charged against the owner of the property.

25. All weeds on vacant lots must be destroyed by the owner of the lot before the weeds have bloomed or gone to seed.

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The Pacific Salmon

After each part of this lesson you will find a skeleton outline. A skeleton outline is the framework in which the main headings, subheadings, and subtopics are to be filled in. When you have finished the four exercises, you will have an outline covering the entire lesson.

I. SALMON AND THE INDIANS OF THE SALMON AREA

Long before the white man came to North America, salmon were playing an important part in the lives of the Indians who lived along the western coast from California northward to Alaska. In that region, which is sometimes called the "salmon area," because of the large numbers of salmon that come there each year, the life of the Indians was very different from what it would have been without this fish. This was true not only of the Indians living on the Pacific coast, but also of the tribes that lived inland near rivers and streams. The map of the salmon area on page 314 shows how far north and how far inland the salmon went.

These Indians depended on the salmon for food. That was the first use they made of the fish. Of course they had other foods. They ate other kinds of fish, and berries and some meat, but their principal food was salmon. The Indians ate the fresh fish during the season when they could go out and catch them. They

also dried and smoked salmon, to be put away for use during other times of the year. Some of the inland

The Salmon Area of the Northwest

tribes had a way of pounding the dried fish into fine bits, which they carefully stored in baskets. This powdered food kept well and was easy to carry from place to place. Indians were saved from starvation during the long winter months by the dried salmon which they had stored.

The location of the Indians' homes was affected by salmon. The Indians who lived on the Pacific coast built villages in which they stayed most of the time,

because they could catch fish there all the year round. They did not have to move from place to place to find a new supply of food. On the other hand, the inland tribes had to move about to keep themselves supplied with food. Each year they moved to the banks of the rivers at the time when the salmon were going upstream. When this season was over and there were no more fish to be had, they left the riverbanks and moved to places where they could find other food. Year after year they moved back to the river during the salmon season.

These Indians needed boats for their fishing. Because there were salmon and other fish to be caught, they built a certain kind of boat that was useful for their fishing. It was called a "dugout," because it was made by hollowing out the trunk of a large tree. The Indians sometimes carved beautiful figures on the fronts of their boats. They took trips up the streams that emptied into the ocean, and in the larger boats they sometimes paddled a long way out into the ocean.

Indians have always told stories about the animals that lived near them. In some parts of North America they told stories of the birds and beasts of those regions. Here in the Northwest the Pacific Indians told stories about the salmon, the fish whose coming and going affected their lives so much.

You can see what an important part salmon played in the lives of these Indians. Their lives would have been very different if it had not been for these fish.

Can You Fill in Subtopics?

The part of the lesson you just read tells four ways in which salmon affected the lives of the Indians. Copy the skeleton outline as it is given below. Fill in the four subtopics. *Do not write in this book.*

I. Salmon and the Indians of the salmon area
  A. Location of the salmon area
  B. How salmon affected the life of the Indians
    1. ___?___
    2. ___?___
    3. ___?___
    4. ___?___

II. LIFE HISTORY OF THE SALMON

As you read this part of the lesson, watch for six steps in the life history of the salmon. In some cases more than one paragraph will tell about one step.

Salmon are hatched in the clear, cool inland streams, the waters of which finally find their way to the ocean. There is something interesting about these tiny baby salmon. Each baby has under its body a kind of sac called the "yolk sac." In this sac, which is connected with the inside of the body, is the food for the baby salmon. The salmon does not eat this food with its mouth, but slowly takes the food, as it needs it, into the body and digests it.

While the yolk is being digested, the little fish hides in the gravel or under a rock. Thousands of these tiny fish will hide in this way so that larger fish will not find and eat them. When each baby salmon has used all the food in its yolk sac, it will begin to search for food. The little fish finds insects and very small plants and animals that are in the water. These are its food.

When the young salmon are several months old, they are covered with many scales, which give them a silvery color. Then they are ready to start down the stream to the ocean. This may be a long journey or a short one. Sometimes they are six months old, or even older, by the time they finally reach the ocean.

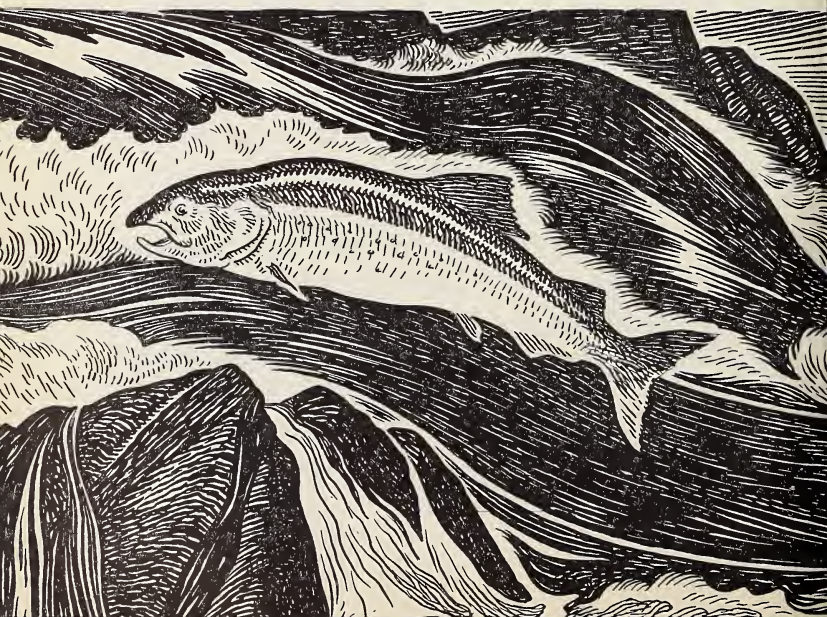
There the salmon live until they are full grown. One kind of salmon found in the Pacific Ocean is full grown in two years, but another kind is not fully grown for from four to seven years. The salmon live within a few miles of the coast, where they can feed on small shellfish. They eat a great deal and grow large and fat. The average full-grown salmon weighs from five to twenty pounds, depending on the kind, or species. A few salmon that have been caught have weighed as much as one hundred pounds.

In the spring great numbers of salmon leave the ocean to go up the streams. Such a company of fish is called a "school." The passing of such schools, all swimming upstream, is called a "salmon run." When the salmon are running, a river is sometimes so full

of fish that a person could not walk into the water without stepping on them.

This journey upstream is an amazing one. After the fish have once started for the spawning grounds, they do not let anything stop them. The river may have rapids. The salmon will push forward through them. There may be waterfalls. The fish will leap over them, sometimes to a height of ten or a dozen feet. If the stream is blocked by anything like a dam or a landslide, the salmon will still try to push on, often dashing themselves to death as they try to get over whatever is in their way.

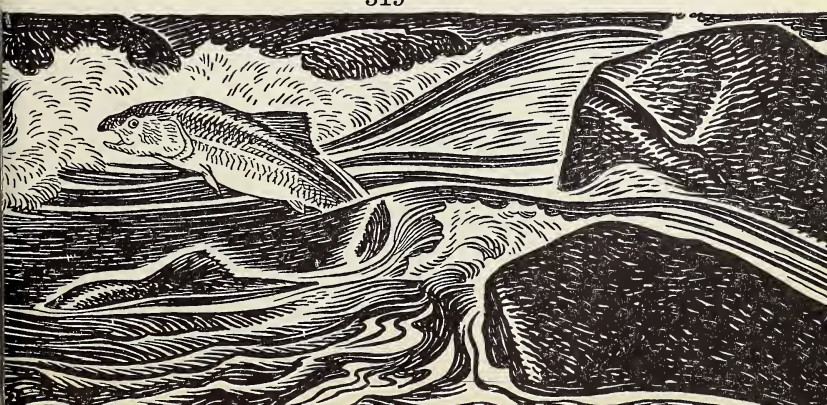
These full-grown salmon are going up the streams to find a place to lay their eggs, or "spawn." The place where they do this is called the "spawning



grounds." Salmon never spawn in the ocean where they have spent most of their lives, or in salt water. They go up fresh-water streams and rivers to find their spawning grounds. A place with a smooth bottom in the shallow part of a river is the best. Most salmon, but not all, return to spawn in the stream in which they were hatched.

When the salmon finally reach the spawning grounds, they are very tired and weak. They have not eaten since they left the ocean. Their long journey upstream against the river current has been very hard. Some of them may have traveled hundreds of miles. Many have bruised themselves against rocks.

At the spawning grounds the mother salmon scoops out a shallow hollow in the smooth bottom of the stream. This is the nest where she will lay her eggs. Sometimes she lays as many as five thousand. Then the father salmon covers them with a fluid from his body. After this, the mother salmon, with several sweeps of her tail, covers the eggs with gravel. Then her part is done. She leaves them to hatch.



What happens to the father and mother salmon then? They may stay around in this part of the stream for a little while or they may start at once to float downstream, always going tail first. They do not try to swim. They make no effort to get back to the ocean. Within a few days they will die, either from starvation or from tiny animals and plants that live on them.

In the meantime, the eggs are being kept warm by the gravel which covers them. They are also hidden from the fish that like to eat salmon eggs. When the baby fish hatch, they will live, you remember, on the food in the yolk sacs that are part of their bodies. After a while they will be big enough to start downstream.

Can You Fill in Subheadings When Paragraphs Are Not a Guide?

Under Roman numeral II letter your paper from *A* to *F* in capital letters. Fill in the six subheadings. *Do not write in this book.*

II. Life history of the salmon

A. ___?___

B. ___?___

C. ___?___

D. ___?___

E. ___?___

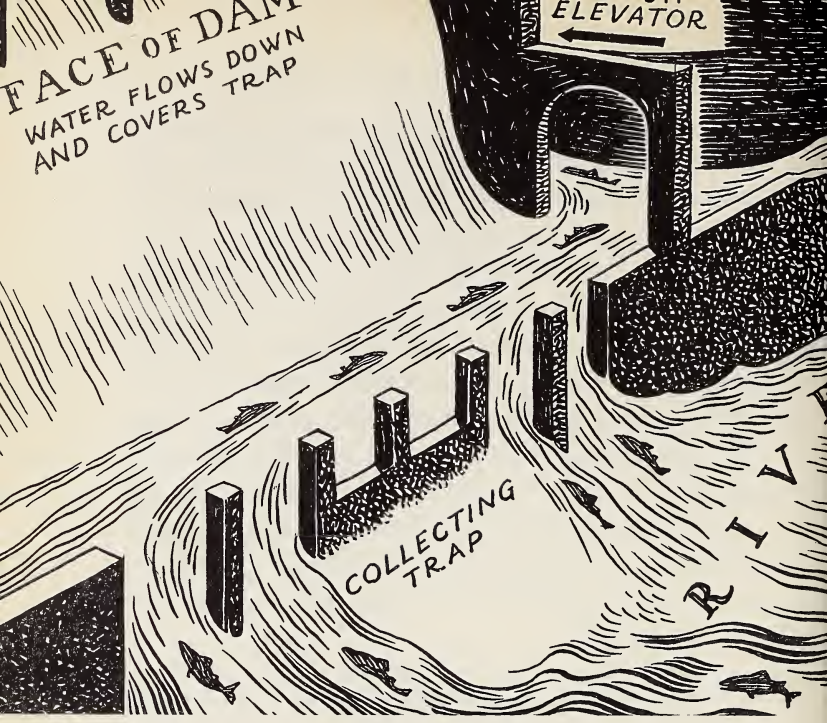
F. ___?___

III. CONSERVATION OF SALMON

As you read this part of the lesson, watch for the ways in which salmon have been destroyed and the ways in which they are now being conserved.

There are not nearly so many salmon on the Pacific coast as there once were. Two principal reasons for the decrease in the number of these fish are: first, the bad fishing practices; and second, the many things that man has done that interfere with spawning. The people in the Pacific states, Canada, and Alaska are worried about the future of the salmon industry. They think that unless we do more than we are now doing to protect the salmon, these fish will disappear from the Pacific coast.

The number of salmon has been greatly decreased by bad fishing practices. There has been much waste from catching salmon before they are full grown. There has also been overfishing, both in the streams and in the ocean near the shore. When a school of salmon is making its way from the ocean to the spawning grounds, there are so many in the water that it is easy to catch them. Some fishermen catch as many as they can and give no thought to the effect upon the future of the salmon industry. The result is that fewer and fewer salmon have lived to return to their spawning places. Laws have now been passed, however, forbidding fishing except at certain times of the year,



and forbidding anyone to catch salmon that are not full grown.

As the salmon journey up certain rivers, they are sometimes stopped by dams which man has built. The fish cannot get over these dams, but they keep on trying until they are so bruised that they die. This means that they never reach the spawning grounds to lay their eggs. In recent years fish ladders have been built in some rivers to help the salmon get over the dams.

Mills have been built along some of the streams, and from them waste material has been thrown out into the running water. Salmon will not spawn in dirty water. They want pure, cold water for spawning. Plans have been made lately to stop the emptying of any kind of waste into salmon streams.

Besides the things that may keep the full-grown fish from getting back to their spawning grounds, there are things that may happen to the young fish. Many young salmon, as they are on their way downstream to the ocean, swim into irrigation ditches and die there. Such ditches are now being carefully screened so that the young fish cannot swim into them.

Although these plans will help protect the salmon industry, many people think they will not help enough. For this reason, millions of baby salmon are being raised in fish hatcheries. The young salmon are put in streams from which they can easily reach the ocean.

Can You Fill in Subtopics?

On your paper write the main heading and the subheadings and number the subtopics as they are given below. Fill in the subtopics. The paragraphs are not a guide. *Do not write in this book.*

III. Conservation of salmon
- *A.* Two principal reasons why salmon are decreasing
  1. ___?___
  2. ___?___
- *B.* Five methods of salmon conservation
  1. ___?___
  2. ___?___
  3. ___?___
  4. ___?___
  5. ___?___

IV. SALMON CANNING

As you read this part of the lesson, find all the information that is given about salmon canning.

Today the Pacific coast is the greatest salmon-canning region in the world. At the mouth of almost every river from California to Alaska there has been, at some time, a salmon cannery.

In locating a salmon cannery certain needs must be kept in mind. It must be placed where it is easy to get

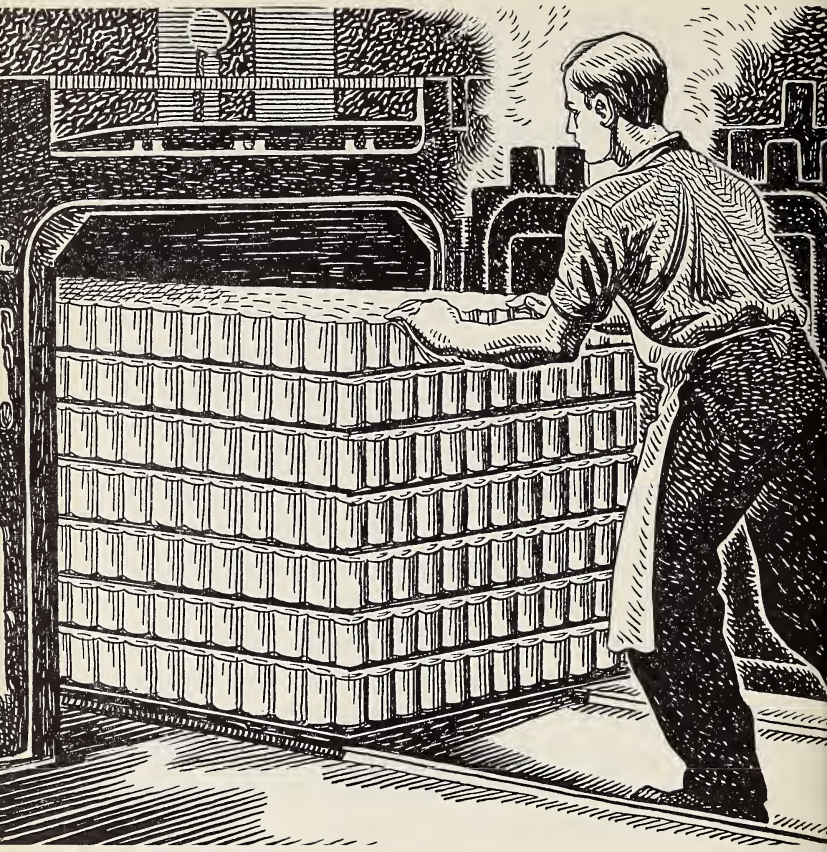
plenty of fish, and where there is a supply of fresh, pure water. A good landing place is needed for the boats that bring the fresh fish to the cannery, and also carry away the canned fish, when it is ready. The water must be deep enough for these boats to come to the wharf. For this last reason most of the canneries, although they are on rivers, are located also very near the place where the river runs into the sea.

Let us follow each step in canning salmon, from the time the fish are unloaded from the fishing boats until the canned salmon are ready to be shipped to the markets of the world. Machinery does most of the work in a modern cannery. First, when the boats come to the cannery, the salmon are unloaded by elevators that run from the boats to the first floor of the cannery. Second, workmen sort the fish into piles, putting all of one kind into a separate pile or bin.

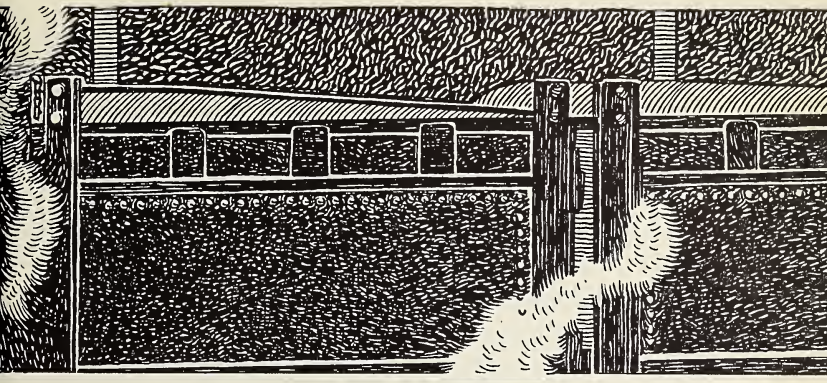
The next step is to clean, or "dress," the salmon. Knives cut off the heads, tails, and fins, and scoop out the waste parts. Stiff brushes remove the scales. Then streams of water are sprayed on the fish. Before the fish are passed on to the next machine, men do any further cleaning that is needed.

Next a slicing machine cuts the fish into sections. The size of the section of fish depends on the size of the can that is being filled. The tail pieces are put aside, for they are not canned with the rest of the fish.

The cans then pass on to a filling machine. This machine drops pieces of the sliced fish and some salt



into each can. A plunger pushes the salmon down into the can. As the cans move along, they pass over a weighing-machine. If they do not weigh as much as they should, they are set aside so that workers can put pieces of fish in the cans. No oil is added during



the canning process. The oil that you see in a can of salmon is from the fish itself.

After the cans are sealed, they are put into steam containers for cooking. Here they may stay from an hour and a half to two hours. The length of time needed for cooking depends on the kind of salmon, the size of the can, and the weather conditions. Just as soon as the cooking is finished, the cans are cooled. If this is not done, the heat from within the can would keep on cooking the fish. The final steps in the canning process are the testing of the cans to make sure that they are airtight, and the labeling.

Most of the salmon from the canneries of the United States is taken to Seattle. From there it is shipped all over the world. In one year canned salmon was exported to ninety-three different countries. The best customers for American and Canadian canned salmon are usually Great Britain, France, and Australia.

Can You Find and Arrange the Subtopics in this Outline?

Only the subtopics need to be found for the skeleton outline for Part IV. Some paragraphs tell about more than one subtopic. *Do not write in this book.*

IV. Salmon canning
- *A.* The greatest salmon-canning region
- *B.* Locating a cannery
  1. ___?___
  2. ___?___
  3. ___?___
- *C.* The work at the cannery
  1. ___?___
  2. ___?___
  3. ___?___
  4. ___?___
  5. ___?___
  6. ___?___
  7. ___?___
  8. ___?___
  9. ___?___
- *D.* Shipping the salmon to markets

When you have finished the outline, use it as a guide to recall what you know about the canning of salmon. As you think about each subtopic, try to recall only the facts that are about that subtopic. If you are not sure that you remember all the important facts about a subtopic, or that what you recall is right, read again the part of the lesson that tells about it.

The Largest Animal on Earth

I. THE SIZE OF WHALES

1. The whale has always been one of the most interesting animals of the sea because of its great size. Most of the early stories of whales, however, were greatly exaggerated. According to one such story, there was in the Indian Sea a fish called "balaena" which was so large that it would cover more than two acres of ground. The balaena is a kind of whale, but a whale is not a fish, and neither the whale nor any fish is large enough to cover two acres of ground.

2. Another writer, named Magnus, told of a whale that was 960 feet long. That was a whale of a story! You can see why one man said, "All whales shrink under the tape measure." But do you know how large whales really are?

3. Although no whale ever lived that was so large as those described in early stories, the very largest whales are truly enormous. One large whale that was carefully measured was 95 feet long and 39 feet around. Many whales have been measured that were more than 80 feet long, but most of those caught by whale hunters are much smaller.

4. There is no other animal on the earth today that is so large as the largest whale. One man who has studied a great deal about whales says, "No creature known to science ever existed which was larger than

the largest whale." Even the enormous dinosaur of past ages was not so large as the largest whale.

5. All whales are not the same size. One kind of very small whale, even when fully grown, is not more than four feet long. Whales are different from each other in length, as well as in the height and thickness of their bodies. Large whales are a little more than five times as long as they are high.

6. You would expect the largest kinds of whales to be very heavy. The large whale that was 95 feet long and 39 feet around is said to have weighed 147 tons. Since a ton is 2000 pounds, this whale weighed 294,000 pounds. The heart alone of such a whale would weigh more than 1000 pounds. One man who has hunted whales a great deal says that 76 feet is the average length of the blue whale. One blue whale 78 feet long was cut up and weighed in pieces. It weighed 63 tons, which would be 126,000 pounds. This whale weighed more than ten of the largest circus elephants.

7. We usually think of baby animals as being very small, but a baby whale certainly is not small. It is a

giant compared with most full-grown animals. Of course, its size depends upon the kind of whale it is. Most baby whales are more than one third as long as their mothers. One baby blue whale, whose mother was 80 feet long, was itself 25 feet long and weighed 8 tons, or 16,000 pounds. It was heavier than a full-grown elephant. That one baby whale would weigh as much as five medium-sized automobiles or eight very large horses! When you think that a baby elephant weighs only about 150 pounds, you can see that the baby whale is many times as heavy.

8. One of the most interesting things about a baby whale is how fast it grows. During the first three months of its life, it lives on its mother's milk. After that, it begins to get some of its food from the sea. By the time it is seven months old, it is more than half grown and does not have to be fed by its mother. And imagine this: A baby blue whale gains about 200 pounds a day until it is seven months old! Do you wonder that the whale is the largest animal that has ever lived?

9. But how are these very large whales able to live? In the first place, whales live in the ocean, which sup-

ports the great weight of their bodies. Unlike the animals on land, they do not need legs to stand on. Unlike the birds of the air, they do not need wings to support themselves.

10. In the second place, the large whales are able to live because they get their food easily. Birds and animals on land must work hard to get enough to eat, while the sea furnishes whales with a steady stream of food. In the third place, land animals are often in great danger from their enemies, but the great jaws and teeth of the sperm whale, and the powerful tail of the blue whale, give them protection.

What Do Large Numbers Mean to You?

When boys and girls are reading their lessons, they often skim over large numbers without stopping to think of what the numbers mean. They may have developed this habit because they do not know how to use numbers in their thinking. One way to understand numbers better is to compare them with numbers that are already known.

Below are five statements dealing with length, height, and weight that will help you to understand the large numbers in this lesson. Read each statement and then answer the question that follows.

1. An average schoolroom is about thirty feet long. How much longer was the largest whale described in paragraph 3?

2. We think of a six-foot man as being very tall. Suppose a six-foot man is lying down. How much longer than the man is an eighty-foot whale?

3. A very large work horse may weigh 2400 pounds. How much heavier than a work horse was the largest whale described in paragraph 6?

4. An average fifth-grade child gains a little less than one pound each month. How many more pounds does the baby whale described in paragraph 8 gain in one month?

5. Bolivar, a large circus elephant, weighed 12,000 pounds. How much heavier than this was the baby blue whale described in paragraph 7?

II. KINDS OF WHALES

1. There are two main kinds of whales, the toothed ones and the toothless ones. They eat different kinds of food and have very different kinds of mouths.

2. The sperm whale is the largest and most valuable of the toothed whales. The most unusual thing about the sperm whale is its head, which is about one third as long as its body. In its head there is a huge

cavity called the "case," which contains valuable sperm oil. Imagine a head more than twenty feet long that contains barrelfuls of oil!

3. The jaws and teeth of the sperm whale are large and powerful. They are so powerful that the sperm whale is able to live on the big fish and large sea animals that it hunts deep in the warm tropical oceans where it lives.

4. The toothless whales have no need of teeth. They have a great fringe of whalebone hanging from the roofs of their mouths. This is not really bone at all, but a horny fringe, somewhat like the material of our fingernails, only much heavier. As toothless whales swim through the water, bushels of small shellfish and sea animals are swept into their open mouths. One writer says that this food is sucked down like an endless meal of soup. The water is forced out through the whalebone strainer, and the food is swallowed. It is easy to see why such whales do not need teeth. No animal gets a living more easily.

Can You Choose the Sentence That Gives the Best Summary of a Paragraph?

Number your paper from 1 to 4. For each of the paragraphs in Part II there are three sentences, one of which best summarizes the paragraph. Summarizing a paragraph means giving its important points in a few words. Opposite each number on your paper, write the letter of the best summary sentence.

1. *a.* There are two main kinds of whales, the toothed and the toothless.
   b. Different whales eat different kinds of food.
   c. The toothed whales and the toothless whales have different kinds of mouths.
2. *a.* The sperm whale, which is the largest of the toothed whales, is of value for sperm oil.
   b. The sperm whale is the largest of the toothed whales.
   c. The head of the sperm whale is about one third as long as its body and contains oil.
3. *a.* The sperm whale feeds in warm oceans.
   b. The sperm whale is able to eat big fish and sea animals because of its great jaws and teeth.
   c. The sperm whale is big and powerful.
4. *a.* A toothless whale does not need teeth because it lives in the water.
   b. A toothless whale does not need teeth because it swallows small shellfish after the whalebone strainer separates them from the water.
   c. A toothless whale eats bushels of small shellfish and sea animals.

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III. THE STRENGTH OF WHALES

1. Another good way to understand how large and powerful whales are is to read stories that tell about their great strength. Mr. Roy Chapman Andrews, who has gone whale hunting many times, has written about an adventure of the crew of a steamboat named the *Puma*. One morning when a large blue whale was seen, the harpoon was made ready. The harpoon, a kind of spear with a strong rope fastened to it, is used for catching whales, seals, and other sea animals. When the whale felt the great harpoon strike and fasten itself in its body, it suddenly grew wild with anger or

fear. The *Puma* could not get near enough to shoot another harpoon into it. All day the whale dragged the *Puma,* in spite of the fact that the engines were set to drive the steamboat the other way. At one time, when the whale was especially wild, it put forth all its strength and dragged a part of the steamboat under water, flooding one cabin and part of the engine room. This powerful animal fought for more than a day, and before it was killed, it had dragged the *Puma* thirty miles.

2. Whales travel great distances in search of food, which is found in different parts of the ocean at different seasons. They have been known to travel thousands of miles. One whale, caught near Norway, held in its flesh a part of an old harpoon that had been shot into it by whale hunters off Newfoundland. It had swum across the Atlantic!

3. Sometimes boats or even small ships are sunk by the wild, angry charging of whales. Mr. Andrews, in his book *Whale Hunting with Gun and Camera,* tells how a wooden ship was sunk by a whale. This was a finback whale, by no means so large as the blue whale. "In one of its wild dashes the sixty-ton whale, coming at a speed of probably twenty-five knots, drove straight into the ship, crushing her side like an eggshell and almost tearing her apart. The vessel filled so rapidly that the crew was hardly able to get a small boat over before she went down. Later the men were all rescued."

4. Mr. Andrews thinks that most ships that have been sunk by whales have really been sunk accidentally. He says that just before a whale dies it goes into what is called a death flurry. In this death flurry the whale dashes wildly about in every direction. It sometimes raises its great body fifty feet above the water and then dives far below the surface. If a ship or boat happens to be near it, the vessel is almost certain to be rammed or crushed, for the whale is probably blind in its rushes during this death flurry.

5. Although whales usually sink boats or small ships by accident, the sperm whale has been known to sink them on purpose. Men have told of times when maddened sperm whales, only slightly wounded, have sunk vessels of even three hundred or four hundred tons. The whale is the only animal great and powerful enough to sink ships of this size.

6. In spite of his great strength, however, the whale is not feared by the whale hunters of today. No longer is the whale hunted in small sailing ships. No longer is he harpooned from a small boat which can be easily overturned by a flip of the whale's tail or broken to pieces by a fierce charge. The whale hunter of today sets out in a huge ship, which is really a floating factory. Some of these ships are as large as most ocean liners. Along with these great ships go smaller but swifter hunting ships. When a whale is sighted by one of the smaller ships, it is shot with a harpoon from a special type of gun. The harpoon

contains a bomb which explodes, killing the whale almost instantly. Air is then pumped into the whale's body to make it float, and the whale is towed to the floating factory. The whale really has no chance to injure the hunters of today or even to escape from them.

Can You Match Summary Sentences and Paragraphs?

Number your paper from 1 to 6. Skim paragraph 1. Read the summary sentences given below. Opposite number 1 write the letter of the sentence that best summarizes the first paragraph. Opposite number 2 write the letter of the sentence that best summarizes the second paragraph. In the same way, find the summary sentences for paragraphs 3, 4, 5, and 6. In each case, write the letter of the sentence after the number of the paragraph which it summarizes.

a. Whales have been known to swim great distances, even across the Atlantic Ocean.

b. In a death flurry, a whale may accidentally sink a ship.

c. Mr. Andrews tells how a large blue whale dragged the *Puma* thirty miles before it was killed.

d. Maddened sperm whales have been known to sink ships on purpose.

e. Mr. Andrews tells how a finback whale crushed the side of a ship.

f. Whale hunting is not so dangerous today as it was in the days of sailing ships.

The Cattle Kingdom

I. THE CATTLE INDUSTRY IN TEXAS

Texas was the center of the old cattle kingdom. Long before the Pilgrims landed in Massachusetts, Spanish explorers, dressed in clanking armor, drove herds of cattle with them for food as they traveled across Texas in their search for gold and silver. Before any Americans settled upon the broad, grassy plains of Texas, both Spanish and Mexican ranchers raised large herds of cattle south of San Antonio.

The Spaniards found southern Texas almost a perfect country for raising cattle. The climate was mild, and neither snow nor blizzards swept down across the open plains. Grass was plentiful, and in many places it stayed green the year round. Water was found in the beautiful river valleys that crossed the plains and flowed into the warm Gulf of Mexico. Clumps of trees provided shade and protection for the herds.

Soon after 1800 American settlers began to push into Texas to make homes. They were the future cowboys. They soon were able to ride as well as the Mexicans, for it was necessary for them to become good riders if they were to remain alive in Texas. Like the Mexicans, the American settlers were always in danger of being attacked by the tribes of fierce Indians who roamed the plains on swift ponies. These ponies were descended from horses either lost by the early Spaniards or stolen from them by the Indians of the region.

Before 1836 Texas was a part of Mexico. Then came the Texas Revolution. So many Americans had come to Texas that they no longer wished to remain a part of Mexico, but they wanted Texas to become a free country. When Texas became a republic, the Mexicans found it impossible to stay on their ranches north of the Rio Grande. Leaving many of their cattle and horses behind them, they left Texas.

The Texans moved into the cattle country and took

charge of the ranches the Mexicans had left. The new Texas Republic declared that all unbranded cattle were public property. That meant that all cattle carrying no owner's brands belonged to whoever branded them. The Texans soon began to collect the roaming herds and to put their own brands upon them.

However, the Texans had certain difficulties. The Mexicans still claimed Texas and continued to make trouble north of the Rio Grande. Indians on swift ponies swept down upon the settlements, killing and stealing as they went. So, in 1845, Texas was glad to become a part of the United States. The Texans then had the help of the United States army to drive out the Mexicans and Indians.

From the time of the Texas Revolution in 1836 to the end of the American Civil War in 1865, cattle grew wild in Texas. A few of them were marketed, but they had little more value at that time than the other wild animals of the plains. There were no railroads to ship cattle to Northern and Eastern markets. To drive them overland was dangerous and often cost more than the animals were worth.

Cattle increased on the grassy plains of Texas until they became almost a pest. It is said that they were far more dangerous to a man on foot than the fiercest buffalo. Any cowboy who attempted to herd them had to do it on horseback, with a rope and a six-shooter at his side.

After the Civil War, large cities began to grow up in the North—great manufacturing cities hungry for meat. Then the rounding up of cattle began in Texas. Great herds were driven past San Antonio, Austin, Fort Worth, on and on. These cattle were to furnish meat for the growing cities to the north and east. From 1866 to 1890, thousands of head of cattle left Texas every year. During those years the old cattle kingdom was at its height.

Can You Arrange Events in Order?

Often in your reading of social science or history, you find events that are closely related because they follow each other in order of time. In order to understand these events you need to know in what order they come.

Some of the events in the history of the cattle industry in Texas are given below. Number your paper from 1 to 10. Read the list of events. Which event comes first in the history of Texas? Write the letter that is before it after number 1. Arrange the other events in order by writing the letters of the events after the numbers.

a. A market for meat opened up in the North.

b. The Texans took over the ranches and cattle that the Mexicans left.

c. The cattle kingdom was at its greatest height.

d. Spanish explorers drove cattle across Texas.

e. Texas became a republic.
f. American settlers began moving into Texas.
g. Mexican ranchers were raising cattle.
h. Texas became a part of the United States.
i. Many Mexicans left their ranches in Texas.
j. Cattle grew wild on the plains of Texas.

One way to check whether or not you have arranged the events in order is to write opposite each event its date. Then you can see whether or not the dates are in order. Dates for several events are given in the lesson. If you have finished the exercise before the rest of the class, find these dates, and write them opposite the events.

II. THE ROUNDUP

After the Northern cattle markets opened up, ranches spread far and wide over the Texas plains. Indians were pushed farther and farther back, and cattle grazed on the grassy plains, where only antelope and buffalo had lived before.

Soon the range, as the open, grassy plains were called, became crowded. Herds from different ranches could no longer be kept separate. So it became necessary to hold roundups.

Two roundups were held each year, one in the spring and one in the fall. A roundup between 1870 and 1880 was likely to cover an area lying within a rough circle two to four hundred miles around. All

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the ranchers within this area took part in the roundup. One man was selected for roundup boss, and everyone took orders from him.

Each ranch owner sent an "outfit" to take care of his part of the roundup. An outfit was made up of all the horses, wagons, and men that came from one ranch. The *chuck wagon* carried food, bedding, and tents. Food was prepared from the back of the chuck wagon. The *hoodlum wagon* carried the water barrel, wood, and branding irons. It furnished the chuck wagon with wood and water, the branding crew with wood, and the cattlemen with drinking water.

The *horse wrangler* was an important member of the outfit. He took care of the ponies for all the cow-

boys. There were from 125 to 150 ponies in most outfits, each cowboy having from eight to fourteen ponies.

When outfits from all the ranches taking part in a roundup had gathered, the meeting looked like an army camp. There were busy days for everybody before the roundup actually began. Bridles were mended, ropes were limbered up, and everything was put in order. The cowboys had lots of fun as well as work during these days.

Then came orders "to bring in everything that wore hair and horns." Troops of cowboys scattered out and drove every cow toward the center of the range. By noon several thousand head of cattle would appear at the roundup camp. The cattle milled about, moving round and round in a circle upon the plain. The cattle of a dozen or twenty ranches might be in a single milling herd.

Cowboys circled the herd, heading off animals that tried to break away from the group. By looking at brands, the men could separate the cattle into herds belonging to different owners. The man on whose range the roundup had started separated out his cattle first. Unbranded calves always went with their mothers.

Work went on day after day until all the cattle on the first range had been rounded up. Then the roundup camp moved, and the owner of the first range held his cattle there while the other herds were driven to the next range. From the first day of the

roundup, there were as many separate herds of cattle as there were owners of cattle. These had to be herded day and night.

As the roundup continued and more and more cattle were driven in from the ranges, the herds grew bigger. The cowboys had to work harder and harder. Their working hours became longer and longer. Everybody worked twelve to fifteen hours a day, and sometimes men stayed in the saddle for eighteen or twenty hours a day. Handling thousands of head of wild longhorn cattle on half-wild cow ponies was dangerous work, but the Texas cowboys were a brave set of men.

The main purpose of the spring roundup was to brand the calves. That in itself was a dangerous job. Cowboys roped the animals and threw them upon the ground. Other men branded them.

Each ranch owner had his own brand, which was on record at the courthouse. This record of his brand protected the rancher, since no one else had a right

to claim cattle carrying this brand. The brand might be the initials of the owner or some grouping of lines, diamonds, circles, dots, or figures. A ranch usually went by the name of its brand, followed by the word *outfit*. Some well-known ranches that took names from their brands were the *101 Outfit*, the *Hashknife Outfit*, and the *XIT Outfit*.

The cattle were not only branded at the roundup but they were also marked on the ear. This was another way of showing ownership. The mark, like the brand, was also on record at the courthouse. It was important for the cattleman to select a brand and a mark that could not be easily changed by cattle thieves, or rustlers, as they were called.

The purpose of the fall roundup was to brand the calves born during the summer and the strays. At that time cattle were also selected for marketing the following spring.

Can You Find the Meanings of Words from Your Reading?

You can tell from your reading what each word in the following list means. Sometimes the meaning is given in a phrase that comes right after the word. At other times you may have to read a whole paragraph to find out what the word means before you put the meaning in your own words. The words are not

in the order in which they come in the story; so you will have to skim to find them. Be ready to tell the meaning of each word.

range	chuck wagon	herds
roundup	horse wrangler	outfit
a cattle brand	hoodlum wagon	rustlers

III. THE NORTHERN DRIVE

Many trails led out of the old cattle kingdom, but none was more famous than the Chisholm Trail. In many places it was almost a quarter of a mile wide. Beaten bare by thousands of herds, it was a dusty, dirty band across the green, grassy plains. The Chisholm Trail led uphill and downhill to the north for more than six hundred miles.

During the first years of the cattle drives, cattle were driven great distances before they reached railroads to carry them farther east. Herds had to travel through what is now Texas, Oklahoma, Kansas, Arkansas, and a part of Missouri. The Missouri Pacific Railroad had been completed as far west as Sedalia, Missouri, where cattle could be shipped to cities in the East.

During the last years of the cattle drives, cattle trails became shorter, because railroads went farther and farther west. Cattle-shipping towns grew up in Kansas, Oklahoma, and Texas. Herds were also driven to Northern and Western ranches that were being

stocked with Texas longhorns. Wyoming, Montana, Colorado, and New Mexico became a part of the cattle kingdom.

The Northern drive itself was very much like the roundup. At the end of the roundup, cattle ready to be marketed were turned over to a drover, or trail captain. The captain selected one cowboy for about every 175 head of cattle. Thus sixteen or eighteen men took care of three thousand head. Only the best cowboys of the range went on the trail. The work was hard and dangerous, and the hours were long.

Cattle usually left Texas very early in the spring. There were two reasons for this. First, there was grass growing at this season that would furnish food for the cattle along the trail. And second, if the herd was to be driven far to the north, it was necessary to start

early in order to reach the end of the drive before cold weather set in.

The cattle moved along the trail in a long, waving line. During the first days of the drive, the cattle were forced to travel twenty or twenty-five miles a day. That was done to get them quickly used to the trail, to get them away from their home range, and to make them so tired that they would lie down quietly at night. After the first few days, the herd would organize itself, with the stronger cattle in the lead and the weaker ones behind. Then the cattle usually traveled twelve or fifteen miles a day.

Some of the best cowboys stayed near the head of the line. The other cowboys worked in pairs around the herd. The trail captain circled the herd, laid out the trail if it were new, and chose the campgrounds. The chuck wagon, with the cook, was always on hand to feed the men when they made camp. The horse wrangler followed along behind with the ponies.

The dread of the cattlemen on the trail was a stampede. When a herd stampeded, it went wild and started to run. There was no way to tell in which direction it would go. The stampede might lead the herd into deep canyons, over bluffs into a river, or out over the plain.

Great care was taken to prevent stampedes during the first ten days on the trail. After that there was less danger. However, if a herd had once stampeded, it was likely to do it again. During the first days, every man slept with one end of a rope tied to his wrist and the other to his horse, which was saddled and bridled. Sometimes a cowboy would not have his boots off for a week.

The greatest danger of stampedes was on dark, stormy nights. A flash of lightning, a clap of thunder, or the snort of a horse might set off the herd. Sometimes a stampede started for little or no reason at all. When the cattle seemed unusually nervous, the cowboys often sang during the night. This helped to keep the herd from being startled by unusual noises.

When a stampede once started, it was the men's job to get control of the herd and to start it moving in a circle. Then the great danger was passed.

In the excitement of a stampede, a cowboy and his horse did wonderful things. The horse knew that he must lead the herd if it came his way. The speed of the herd was terrible, but the cowboys had to race at the head of the stampede so that they could turn the herd. After the herd began to run in a circle, the stampede slowly came to an end. Then the cowboys laughed and shouted with joy.

Sometimes, a great deal of trouble was caused on the cattle trails by buffalo. Not only did they cause the cattle to stampede, but sometimes many head of

cattle were mixed with the large buffalo herds and became lost. One man who drove cattle from Texas to Kansas over the Chisholm Trail in 1871 wrote:

"Several herds lost heavily at that time by cattle and horses getting into the buffalo herds, which at that season were drifting northward. These animals were in countless numbers. In fact, the whole face of the earth seemed to be covered with them, all going in the same direction. The drovers were compelled to send men on ahead to keep them from stampeding their herds. On a plain we had to stop our herds while the buffalo passed. Buffalo, horses, elk, antelope, wolves, and some cattle were all mixed together. It took several hours for them to pass so that we could continue our journey. I think there were more buffalo in that herd than I ever saw of any living thing."

As a herd of cattle moved along the trail in a long, winding line, the trail captain gave orders to his men in sign language. The signs were made from horseback, and usually were movements of the captain's hat. Such signs told the men about the trail ahead or what to do in handling the herd.

Each day at sundown, the cattle left the trail to graze. At dark they were rounded up to the place where they were to rest until daylight. Men kept watch through the night, riding around the herd. They often sang, not only to quiet the herd, but also to relieve their own loneliness. Old cowboy ballads such as they sang are still among our most popular songs.

For two, three, or even four months, the Northern drive would go on. During the whole time, from daylight to dark each day, the cowboys rode, sang, and even risked their lives to care for the cattle. When the trip was over, they returned to the old cattle kingdom. The next spring they were ready and eager to start out again from the Texas plains, driving another herd over the long, dusty trails to another range or to the railroad.

Kathryn Smith

How Well Do You Picture What You Read?

As you read about the Northern drive, you probably pictured to yourself what it was like. Number your paper from 1 to 10. Opposite each number write the letter of the group of words that best describes your picture. *Do not write in this book.*

1. The old Chisholm Trail was
   a. a narrow path.
   b. a dusty track, some places a quarter of a mile wide.
   c. a smooth highway.

2. The old Chisholm Trail led
   a. over perfectly level land for a short distance in Texas.
   b. over hills and plains through several states.
   c. over perfectly level land through several states.

3. The cattle kingdom
   a. became smaller and smaller.
   b. spread out to the states toward the north and west.
   c. soon disappeared entirely.

4. Often great herds of buffalo caused trouble
   a. by joining the herd and traveling along with the cattle.
   b. by stampeding the herd or because the cattle joined the buffalo.
   c. by frightening the horses.

5. A herd of cattle driven over the trail
   a. usually contained less than a hundred.
   b. might be as large as several thousand.
   c. often contained as few as fifty.
6. The cattle moved along the trail
   a. in a long, waving line, with cowboys here and there.
   b. in a great bunch, with cowboys along the outer edge.
   c. in a number of small herds with cowboys with each herd.
7. The greatest danger of stampede was
   a. at sundown when cattle were hot and tired.
   b. at night, especially during a storm.
   c. in the morning when the cattle were rested.
8. When cattle were unusually nervous
   a. the cowboys sang as they stood guard or rode around the herd.
   b. the cowboys kept the cattle moving on the drive.
   c. the cowboys drove the cattle around to keep them moving in a circle.
9. In case of a stampede, the men and horses worked hard
   a. to get the herd moving in a circle.
   b. to drive the herd into a canyon.
   c. to drive the herd straight ahead.
10. At sundown the cattle were stopped
   a. on the trail and were made to lie down there.
   b. off the trail where they grazed until dark.
   c. in a quiet canyon.

Recognizing Figures

Very often in your reading you find objects described by the use of the words *rectangle*, *triangle*, *square*, and *circle*. You may read, for example, such sentences as these:

The children stood in a circle.

The farm was square.

The land on which the house stands is a rectangle fifty feet wide and a hundred and fifty feet long.

The children of the fifth grade planned a flower bed that was the shape of a triangle.

It is important to know exactly what these words mean if you are fully to understand lessons in which the words are used. It is the purpose of this lesson to make sure that you know the meanings of the four words *square*, *rectangle*, *circle*, and *triangle*.

A rectangle always has four straight sides and four right angles. A right angle is the kind of angle formed by lines at the corner of a square. Sometimes boys and girls think that only oblongs are rectangles, but a square is a rectangle, too. It not only has four straight sides and four right angles, but the four sides are equal. All squares are rectangles, but all rectangles are not squares. Can you tell why all squares are rectangles? Can you tell why all rectangles are not squares?

A triangle has three angles and three straight sides. Not all triangles are the same shape.

A circle is perfectly round; that is, all parts of the line that surrounds it are the same distance from the center of the circle. If you drew straight lines from the center of a circle to any part of the line around it, all these lines would be equal.

Do you understand what is meant by a square, a rectangle, a triangle, and a circle? A good way to test your understanding is to describe each of these to yourself. If you cannot remember what any one of them is like, read again the paragraph that tells about it. Take time to understand it before you go any farther.

How Well Do You Recognize Figures?

1. At the top of your paper write these four headings:

Rectangles	*Triangles*	*Circles*	*Squares*

2. Look at the figures on the next page. Notice that each figure has a letter in it.

3. Under the word *rectangles* on your paper write the letters of all figures that are rectangles.

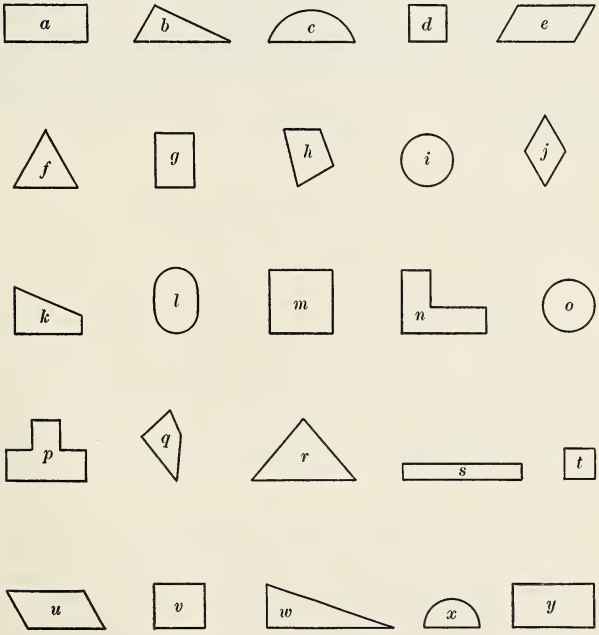
4. Under the word *triangles* write the letters of all figures that are triangles.

5. Under the word *circles* write the letters of all figures that are circles.

6. Under the word *squares* write the letters of all figures that are squares.

How Well Do You Answer Questions about Figures?

1. How many figures are there on this page that are neither triangles, circles, squares, nor rectangles?
2. Why is c not a circle?
3. Why is k not a rectangle?
4. Why is l not a circle?
5. Why is n not a rectangle?
6. Why is q not a triangle?
7. Why is y not a square?



A Tree-Ring Calendar

I. PUEBLO BONITO

1. If you were driving across the desert, should you expect to come upon the ruins of a four-story building of a thousand rooms? That is exactly what would happen if you should drive through Chaco (chä′kō) Canyon in the desert of northwestern New Mexico.

2. In Chaco Canyon stand the ruins, the crumbling walls, of Pueblo Bonito (pwĕb′lō bō nē′tō). *Pueblo* is the Spanish word for "village," and *Bonito* is the Spanish word for "beautiful." Pueblo Bonito, then, means "Beautiful Village."

3. From the ruins you can see that Pueblo Bonito was once an apartment-house city. The great house of a thousand rooms was built of stone and adobe in the shape of a half-circle. In some parts it was at least four stories high. All the people of the village, of whom there were about 1500, lived in it. This building is said to be the largest building for people to live in ever built in America before 1882. The ruins of the great house cover ten times as much ground as the White House in Washington, D. C.

4. As you look at the ruins of Pueblo Bonito lying on the desert, you ask yourself many questions: When did people live in Pueblo Bonito? Who lived there? Was Chaco Canyon a desert then as it is today? How

did the people of Pueblo Bonito live? Why did they leave their village? How many years ago did they leave it?

5. Men called archeologists have uncovered the ruins of Pueblo Bonito and have examined the great house. They have counted the rooms, and they have seen how large they were. They have found tools and pieces of pottery and jewelry that belonged to the people who once lived there. By examining the ruins, these archeologists have been able to tell us many things about Pueblo Bonito and its people. The picture on pages 366–367 shows what archeologists think that building looked like when the Indians lived in it.

Which Paragraph Tells about Each Topic?

Below are five topics that are discussed in the five paragraphs that you have just read. On your paper write the letters from *a* to *e*. Opposite the letter write the number of the paragraph that tells about each topic. *Do not write in this book.*

a. What "Pueblo Bonito" means
b. What questions you might ask about the ruins
c. Who answers the questions
d. Where the building is located
e. What kind of building it is

Choose any one of the topics and plan to tell about it in several complete sentences.

II. THE STORY THE ARCHEOLOGISTS TOLD

1. Long ago Indians lived in Pueblo Bonito. They were very much like the Indians who live in other pueblos of the Southwest today.

2. Chaco Canyon was not a desert in the days when Indians lived in Pueblo Bonito. So many people could not have made a living from a desert where almost nothing can grow. We know that there were forests there, for the great house had beams made of logs that must have come from trees that grew near it.

3. The Indians of Chaco Canyon were farmers. So many farmers lived in the village that they finally cut down all the trees in the forest. They used the soil for planting the crops needed to feed all the people.

4. However, after the trees were cut down, Chaco Canyon became a very poor place to live. Without the roots of trees to hold the plowed soil in place, the rains washed it away and cut deep ditches called arroyos. With arroyos cut through the land, the rains did not stay on the ground and soak into the soil to make the crops grow. The water ran swiftly down the arroyos to join distant streams. Little by little Chaco Canyon became a desert such as it is today.

5. Since there was not enough water to raise their crops, the Indian farmers of Chaco Canyon had to leave their homes. In order to escape starvation, they had to seek new homes near springs or in river valleys far away, where they could grow crops and make a

living. Finally, the great apartment-house city of Pueblo Bonito was deserted.

6. The story the archeologists told stopped there. These men could not tell exactly when the great house had been built. They found nothing in the ruins to tell them how long ago the Indian farmers had left Chaco Canyon. They knew only that it had been before the coming of the Spanish to New Mexico in the year 1540, for the Spanish explorers said nothing about any village as great as Pueblo Bonito had been. In fact, the building was probably covered with sand and dirt then, just as it was when the archeologists found it.

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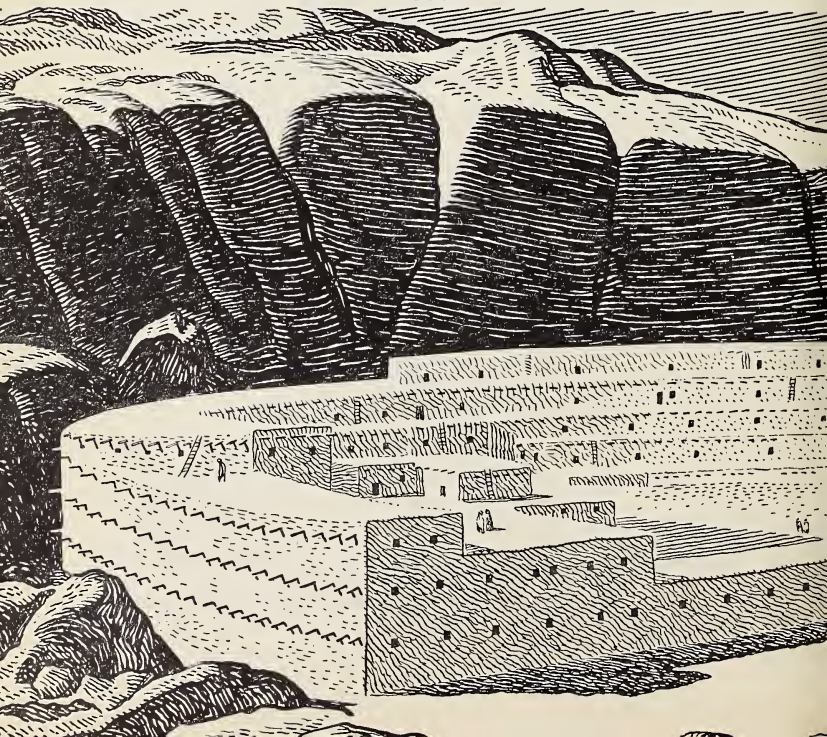


What Paragraph Answers Each Question?

Letter your paper from *a* to *f*. Then find the number of the paragraph that answers each question given below. Write the number of the paragraph after the letter of the question.

a. How do we know that at one time Chaco Canyon was not a desert?

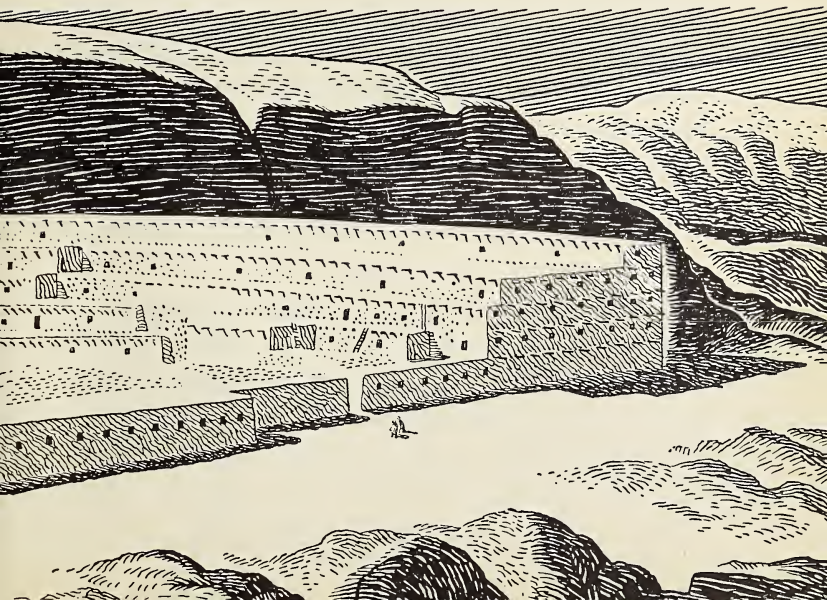
b. What happened when all the trees were cut down?

c. Why did the archeologists believe that Pueblo Bonito had been built before the Spanish came?

d. How did the people of Pueblo Bonito make a living?

e. Who lived in Pueblo Bonito?

f. Why did the people of Pueblo Bonito move?



One man finally thought of a strange way to tell when Indians had lived in Pueblo Bonito. He was not an archeologist, but an astronomer who was especially interested in the sun and weather. He was Dr. Douglass of the University of Arizona.

In studying the sun and weather, Dr. Douglass had examined the tree rings of the pines and firs that grow in the forests of northern Arizona. These forests are not far from the desert region of Chaco Canyon. He learned that tree rings always tell the story of weather in the region where the trees grow. This story is told for every year of a tree's life. Every tree in a region tells the same story for the same year.

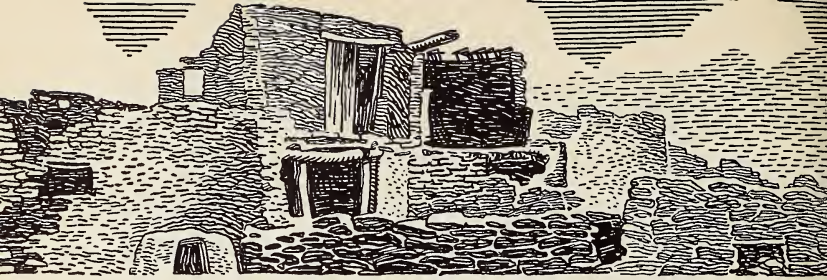
The age of any tree may be learned by counting its rings. On page 369 is a picture of part of a cross section of a tree, showing tree rings. Each year a tree adds a new layer of wood that forms a new outside ring. The distance from the dark line of one ring to the dark line of the next ring shows one year's growth. How old was the tree shown in this picture?

Dr. Douglass learned that if the weather had been very dry during a certain year, the tree rings of all the trees were narrow for that year. If there had been plenty of rain, the tree rings of all the trees were wide. After he had examined tree rings of many trees, he was able to tell the years in which certain rings were grown just as easily as if they had been dated.

A friend of Dr. Douglass's sent him the tree rings from logs used as beams in some old ruins of the Southwest. He hoped that Dr. Douglass could tell him when these trees grew. Perhaps by telling the date of the outside ring he could even tell the year in which the Indians cut these logs.

Dr. Douglass became interested in helping the archeologists to find the dates for the ruins. He began to try to tell the age of Pueblo Bonito. He searched for the oldest living tree that he could find. He got a cross section of one 640 years old. However, it had an injury near the center, which made the rings hard to examine. The tree had almost died in its early life, but it gave a tree-ring calendar beginning before the year 1300.

However, Dr. Douglass had not yet found rings that matched those sent to him from the ruins of Pueblo Bonito. He knew that he must search farther. He went to the very oldest of the present Pueblo villages in search of old logs. He studied those that had rough ends, because he knew they had been chopped with stone axes before the coming of the white men to the Southwest.



In his search, Dr. Douglass found a very old post in a vacant house. Its outside rings matched the inside rings of the oldest log he had. This added to his calendar, and he was able to date any logs that had been growing since the year 1260. Although he was not yet able to date the logs from Pueblo Bonito, he knew that the village must have been built before 1260.

Finally, a piece of wood, black and partly burned, was found in some ruins. This piece of wood told that the tree from which it was cut had begun to grow in the year 1237. It had rings that matched both those of Dr. Douglass's tree-ring calendar and those found in beams from Pueblo Bonito. It filled in the gap in his calendar!

Now Dr. Douglass was able to finish the story the archeologists told. The oldest beam in Pueblo Bonito had started to grow as a tree in the year 700 A.D. It had been cut in 919 when it was 219 years old. He decided that many new rooms were built in the pueblo about the year 1067, for many logs found in the building had been cut in that year. People were still living in the village in the year 1127, for new logs were cut then.

IV. USES OF THE TREE-RING CALENDAR

Not only has Dr. Douglass been able to tell when the Indians built Pueblo Bonito, but his tree-ring calendar has made it possible to tell the age of more than ninety pueblos and cliff dwellings in the Southwest. He has been able to tell something of the weather there in those times. He has told us that between the years 1276 and 1299 there was the worst drought that ever occurred in America. It lasted twenty-three years.

By his work in Chaco Canyon, Dr. Douglass gave the world a tree-ring calendar. This calendar covers the entire period from the year 11 A.D. to the present time, a period of more than 1900 years. It has pushed back the history of this country to a time nearly 1500 years before Columbus discovered America.

Kathryn Smith

Do You Understand What You Read?

Answer each question below. Then turn back to see whether or not your answers are correct.

1. What did Dr. Douglass notice about the tree rings in one tree for different years?
2. What did Dr. Douglass notice about the tree rings for every tree in a forest for the same year?
3. How old was the oldest living tree he could find?
4. By matching the rings of old posts and logs, how far back was he able to extend his tree-ring calendar?

Diving for Pearls and for Fun[1]

Giff and Stiff are nicknames for Gifford Pinchot, Jr., and Steve Stahlnecker. Ever since they were babies together, Giff and Stiff have been the best of friends. So when Giff's father, who was at one time governor of Pennsylvania, planned a trip to the South Seas, Stiff was invited to go along. The two boys had many unusual adventures aboard their ship, the *Mary Pinchot*, and at the places they visited. Giff tells about his trip in a book called *Giff and Stiff in the South Seas.*

Our trip took us to the Tuamotu (to͞o'ä mō'to͞o) Islands. These islands are coral atolls. A coral atoll is a long, round strip of coral that surrounds a big lagoon with a passageway to the ocean.

As we came around an island, we saw the pass that went into the lagoon. It was very narrow, and there was a very strong tide running out; so we decided not to take the *Mary Pinchot* in. We put a small boat over and went ashore.

In among the coconut trees was the village. The houses were all made out of braided coconut leaves. The natives were especially nice and friendly.

The next morning we went to an island where the natives were doing pearl diving. At about eight o'clock we went ashore, met the divers, and towed their boat out to the pearl grounds.

[1] From *Giff and Stiff in the South Seas*, by Gifford Pinchot, Jr., copyrighted by The John C. Winston Company.

These divers don't have modern diving outfits. All they use is a pair of watertight goggles, to keep the pressure of the sea off their eyeballs.

When we got out to the pearl grounds, we anchored the boats, and then the natives started diving. They don't dive the way we do, from a high place. They just swim around on top of the water until they find a place where pearls are likely to be, and then they swim right down to the bottom. We saw them diving in as much as sixty feet of water that day and bringing up oyster shells all the time.

The natives found one pearl the day we were out with them. They do not make most of their money from the pearls, but from the oyster shells that they sell to Chinese traders on the island. These shells are made into all sorts of things, especially buttons.

The next day Stiff and I rigged out the diving helmets. We fastened the pump to the lifeboat and rigged up the hose in the helmet. This outfit that we had wasn't at all like most diving outfits that you see. We didn't have a watertight suit or anything like that. All we used was a big copper helmet that was held down over your head by heavy lead weights. The air that was being pumped down, of course, kept the water out. We could breathe perfectly comfortably.

The launch was going ashore; so we got the men to tow us into shallow water where the natives said there were no sharks.

Stiff was the first one to go down, and then I fol-

lowed. It is a completely different kind of world down there under the water. You can see for short distances just as plainly, if not more plainly, than you can in the air. The colors seem to be much brighter than they are on dry land.

Around each one of the big coral heads there were thousands of different kinds of small fish. Some of them were brilliant blue-green, and others were striped black and white. They all seemed to keep in small schools of the same size and the same kind.

There is one funny thing about diving; you cannot judge distances. When we first tried to knock off pieces of coral with the hatchet, we found that the first couple of times we missed them by about a foot.

Also, when you swing the hatchet just as hard as you can, the water slows you up so much that you

can barely break off a piece of coral. You can hardly walk unless you go sideways or backwards.

We had two helmets and a camera in a waterproof box, so that the photographer could take pictures of the things under water. Dad and Mother both dived a lot and collected coral and giant clams. Once I managed to spear a fish under water.

The native divers were terribly afraid of our diving helmets. When we asked them if they wanted to go down in one in the shallow water, they all shook their heads and smiled. We explained that they could just lift the helmet off if they wanted to come up. There was only one native who would try it, and he was the oldest diver there. He got a big kick out of it, but didn't stay down very long. He didn't seem very anxious to use one all the time, either. I think that this diving was the best experience we had on the whole trip.

Gifford Pinchot, Jr.

How Well Did You Read?

1. Read parts of the story that show that the climate was warm.
2. Tell how the natives dive for pearls.
3. From what did the native divers make the most money?
4. How did Giff and Stiff make their dives?
5. Tell about the interesting experiences they had under the water.

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